Serving the CoCo Community for

The RAINBOW 11 YEARS

THE COLOR COMPUTER MONTHLY MAGAZINE

July 1992 Vol. XI No. 12 Canada $4.95 U.S. $3.95

Feature Program

CoCo 3 Directory Assistance

Have you ever found yourself wading through a stack of full (of course) disks looking for a specific file? (More than once?) It's kind of like trying to find the proverbial needle, isn't it? *Directory Master* is a CoCo 3 program designed to help you out of such haystacks with a minimum of effort. *Directory Master*, which requires a monochrome or RGB monitor, displays up to 68 filenames (the per-disk maximum supported by Disk BASIC) on-screen at one time. And it does a lot more.

To get *Directory Master* running on your CoCo 3, enter both listings presented here and save them to disk. The program shown in Listing 1 is the main program. Before you run it, however, you must run the program shown in Listing 2 to create the screen font *Directory Master* uses for the Hi-Res screen. When you run the program in Listing 2, the new screen font is automatically saved to the disk in Drive 0 — make sure you have at least one free granule on the disk. The font is saved with the name `STRDMOD3.BIN`.

To start *Directory Master*, simply enter `RUN''DMASTER''`. After the program has loaded, it loads `STRDMOD3.BIN` from the disk in Drive 0, then displays the directory for that disk.

The *Directory Master* directory listing is split into four columns. At the top of the screen you'll see the current name for the disk, the currently selected drive, the total number of files on the disk, and the number of free granules remaining. At the bottom of the screen are the 10 command options available to you while running the program. To invoke an option, simply press the single letter associated with it.

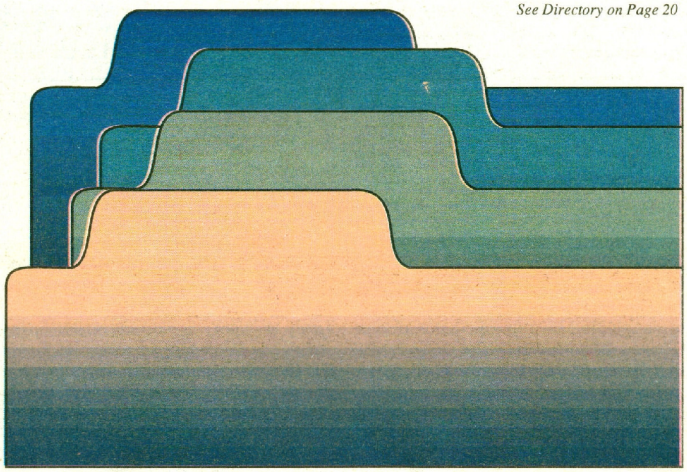
Before I describe these options, let me explain how to select files. When you choose an option that requires you to select a file, the program highlights the first filename in the directory listing. Use the space bar to move this highlight bar down the listing and press ENTER to select the highlighted file. When the bar reaches the end of the listing, it reappears at the top. *Directory Master*'s options are as follows:

R (Execute) — loads from disk and executes the selected BASIC or machine-language program.

L (Load) — loads the selected BASIC program from disk without running it.

N (Filename) — renames the selected file. The new filename and extension are handled separately — enter up to eight characters for the filename,

See Directory on Page 20



Feature Program

OS-9 Repeats Itself

A root reason for using computers is to make the tasks we must perform much easier to accomplish, and this assistance occurs on many levels. For instance, most users of the OS-9 operating system know about the special repeat "key," CTRL-A. You can type a command line, and if you press CTRL-A right after pressing ENTER, you can recall it ad infinitum. This is great for correcting typing errors and makes entering repetitive commands easier. Still, it can be quite cumbersome for many computer chores. This is why I wrote *Rep*.

Rep permits repeated execution of OS-9 commands, taking the commands' parameters from the standard input path (via the keyboard), a pipeline or redirection from a text file. To use *Rep*, simply type `rep` followed by the name of the command you want repeated. In place of the parameter for the command, substitute a dollar sign ($). Let's look at an example.

Suppose you want the header information for a number of binary files that are located in your execution directory. You could enter `ident -x` *filename* to get the information about the first file. (`-x` is OS-9's built-in option for specifying the current execution directory.) Then you might use CTRL-A, backspace over the first filename, type the second one, and press ENTER. Do this for a dozen files and it gets a little old. *Rep* allows you to enter

```
rep ident -x $
```

Upon receiving this command line, OS-9 executes `rep`, which links to the `ident` command if it's present in memory. (If `ident` is not in memory, the system loads it from the execution directory.) `rep` then waits for you to type a filename and press ENTER. When you do this, `rep` executes `ident`, replacing the `$` with the filename you entered. After `ident` displays the module's data, `rep` waits for another entry. Simply continue entering filenames until you have all the information you need. When you are finished, press ENTER —`rep` unlinks `ident` and terminates.

Rep's operation with an OS-9 command can be made more automatic by passing parameters for the command from a pipeline or by redirection from a text file. For example, I use a directory utility called `d` that lists the files in a directory one filename per line rather than spreading them across the screen. If I want to copy all the files in the current data directory to my `ARCHIVE` directory, I use *Rep* as follows:

```
d ! rep copy $ /d1/archive/$
```

`d` supplies `rep` with all the filenames in the directory, one at a time. `rep` executes `copy` for each filename, replacing each `$` with the filename, and copying all the files to the `/D1/ARCHIVE` directory. `rep` automatically terminates after the last file in the directory.

The earliest version of *Rep*, which ap-

See Repeats on Page 12

In this issue:

Back Issue Information 18
Base Conversions
by George Quellhorst 4
CoCo Consultations
by Marty Goodman 18
Corrections 9
Delphi Bureau
by Eddie Kuns 8
Directory Assistance
by Dwight Stegall 1
Electronic Inventory
by Daniel Doner 14
Find the Intersection
by Joseph Pendell 6
Index to the Past Year
by Julie Hutchinson 25
Letters to Rainbow 2
Number Cruncher
by Joseph Pendell 24
One-Drive Backup for 128K
by Joel M. Hegberg 10
OS-9 Hotline 17
OS-9 Repeats Itself
Stephen Goldberg 1
Print#-2
by Lonnie Falk 2
Received and Certified 24
Skip a Line With BASIC09
by John Musumeci 22
What's in Disk File
by Geoff Friesen 4

Product Reviews:
4-D Checkers
*from N*Johnson Software* 7
War Monger
from Sundog Systems 10

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For RAINBOW Advertising and Marketing Office Information, see Page 31.

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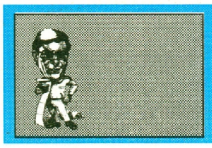


Print#-2

Happy Birthday, RAINBOW!

Well, we've come a long way together, my friends. This issue of THE RAINBOW marks the beginning of our twelfth year of service to the CoCo Community. And, we expect to be around for quite a bit longer.

As I told you in this space recently, we have — overall — received an extremely positive reaction to our new format. Yes, we have had some complaints from a number of readers, and even a few letters cancelling subscriptions. But the overwhelming reaction from advertisers and readers has been very positive.

What is more important is what many of you who haven't written or called directly are saying; you have been "voting" by sending in renewal subscriptions orders. Interestingly, since we changed our format, the renewals to THE RAINBOW have been higher on a percentage basis than they have been in the last year and a half. This is good news for us and for all of you as well.

What has been the biggest complaint we have received? That it is difficult to get the new format into the binders we sell! I believe this means most of you still (and you should!) consider THE RAINBOW as an outstanding source of information about your Color Computer.

(By the way, we are looking into the binder problem. But Ray Meers, one of our readers from California, wrote the other day to tell us he merely folds the new publication over one of the wires in the binder and it works quite nicely. "Something like the way they display newspapers in libraries," he says. We tried it and it works. It must, because Ray ordered some additional binders with his "tip.")

We keep getting new subscribers, too. Not only is this good news for the health of THE RAINBOW, but it is interesting what these new readers are saying. John Walker of Wisconsin wrote us to say that he has finally given up on his Apple]["and was lucky enough to be able to buy a CoCo from a friend who had two systems. One look at THE RAINBOW was enough; I wouldn't be without it."

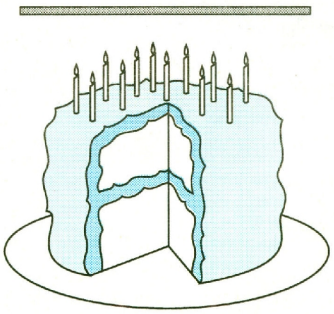
John ordered all the back issues we had, too. Which, incidentally, brings me to a gentle reminder: some of our back issue supplies are running a bit low. We considered selling every one of them in a set as a sort of "CoCo Encyclopedia," but decided not to do that at this time because many of you have a bunch of them and we thought it might be more difficult to do it that way than not. If you are interested in back issues, now is a good time to order them.

It is probably fair to say that the CoCo has won a whole lot of converts in the past year. This is something fairly amazing for a system which has not been manufactured in several years. But when you look at it, the Color Computer has as much power as any of us will likely need in the forseeable future. I wrote about this a few months ago, so I will not belabor the point — my mail seems to agree with me, anyway. Although, I think it only fair to report that it seems I have stirred up something of a hornet's nest — obviously some members of the CoCo Community have misinterpreted what I wrote in the May issue. I'll try to explain it better this time.

I am *not* advocating that *anyone* with a CoCo "change" to an MS-DOS system. I continue to use and appreciate all the many, many things our CoCos can do. Neither am I advocating MS-DOS as a substitute in any way for OS-9 as it is implemented on our Color Computers.

What I *am* saying, however, is that I do not see the new "CoCos" as a viable alternative *if* you want more power and more software options than are now available with your Color Computer. We have researched these machines, tested them extensively and looked carefully at the software market. We do not see them as a viable option for your Color Computer.

I do not see these 68xxx-based machines surpassing your Color Computer in usefulness for the simple reason that I don't believe there will ever be as great a software base for them as there is now for the CoCo.



And the same is true for MS-DOS. I advocated — and still do — that you use your CoCo simply because it is a great computer. But I also said — and still say — if you *are* going to look for another computer, I believe the obvious choice is not some poorly supported 68xxx-based machine, but an MS-DOS computer.

There is one more issue that has prompted a couple of letters in the past week. Upon reading that, I changed the cover from an "illustration" format to a "news" format at the last minute, thus adding space for actual information, a few of you wrote to suggest I might wish to eliminate this column from THE RAINBOW's pages for the same reason.

While I have used "Print#-2," for years to communicate with the CoCo Community, I must admit that the idea has some merit. And I am asking for some input from all of you. Of course, when important things happen, you will find me here in this space. But otherwise, we could devote it to CoCo news and information.

What do *you* think? Drop me a line and let me know. I will appreciate your input (and my feelings won't be hurt if you agree with this idea).

I used to publish a list of people who I believed helped the CoCo Community the most during the past year, but as the list got longer and longer, I dropped it for fear of leaving people out. I am not going to revive the practice this time — primarily because the list would be thousands of names long and would include all of you.

Yes, what has made the Color Computer this past year has been each of you. Your loyalty to the CoCo Community, to our advertisers, to THE RAINBOW and, most of all, to each other.

Long live CoCo!

* * * * *

I do hate to close this column on a sad note, but I must. I would probably not *be* the publisher had I not had the benefit of the wonderful guidance, skillful business acumen and profound advice of a dear and good friend who was an intergral part during much of the early development of both THE RAINBOW and Falsoft, Inc.

Kenny Hirsch passed away in January of this year. The story that ran in the local newspaper the day after Kenny left us said he was a business leader who was active in civic affairs, listed numerous boards and commissions on which he served, and mentioned many of his achievements.

But what mere ink on newsprint could never express was that he was a great and dear man, profoundly loved by everyone he knew. And Kenny knew thousands. To see him greeting his friends each May at the Kentucky Derby — wearing some of the most outlandish combinations of pants and sportcoats I have ever seen — was almost as much a harbinger of spring as the tulips in the gardens at Churchill Downs on the first Saturday in May.

The first Saturday in May is gone, and so is my friend. I miss him terribly. The beauty of his life — an all-too-short 49 years — abides among all who knew him as a loving benediction.

— Lonnie Falk

Letters to the RAINBOW

In Place of the DMP-130

Editor:

I have enjoyed THE RAINBOW thoroughly for more than seven years and look forward to many more. I am truly a die-hard CoCoist (I have a CoCo 1, a CoCo 2, a CoCo 3, two disk drives, a DMP-130 and a CGP-115.

My biggest fear is that I will be left in the dark should something happen to my DMP-130? Will you please furnish me with information about printers that could replace the DMP-130 without my having to make changes to the hundreds of programs I now have? I really want to buy a 24-pin printer for letter-quality printouts. I currently use a serial/parallel converter with my printer.

I have checked with several different Radio Shack stores and printer outlets for this information. So far I have found no one who can be certain what printer will do the job. I would really appreciate any information you can furnish.

Robert Walls
110 Ellis Lane
Fallbrook, CA 92028

While you might get lucky and find an older unit in a Radio Shack back room, Tandy no longer produces printers that support Tandy printer codes. All newer Tandy printers support only IBM/Epson codes. The DMP-130 supports both Tandy and IBM/Epson modes. If you are currently using your DMP-130 in the IBM mode, you shouldn't have much problem replacing it with any dot-matrix printer currently on the market. However, if you have configured your software for Tandy DMP-130 codes, you'll have to reconfigure the software when you replace the printer. We know of no printers currently available that support the older (now obsolete?) Tandy codes.

MVBanner Review Correction

Editor:

I would like to point out an error in the

product review of *MVBanner* (April 1992, Page 7). The review indicates that the Roman font does not support numbers and/or special characters. After talking with Zack Sessions of ColorSystems, I learned an older version of *MVBanner* was accidentally submitted for review. The mistake was found and a correct version was submitted. Unfortunately, the reviewer did not see that the Roman font in the new version does support the entire ASCII character set. If anyone has purchased *MVBanner* and finds it has an incomplete Roman font, please notify ColorSystems to receive a free replacement.

Bruce Geren
346 E. Papago Drive
Tempe, AZ 85281

Computing from a Distance

Editor:

I currently subscribe to THE RAINBOW, and I have a CoCo 3 with 128K. What kind of disk drive can I use with my computer? Also, what kind of printer is compatible with it? Is there a Tandy showroom in Saudi Arabia?

Muhammed Younas Khan
P.O. Box 50
Zuifi City 11932
Kingdom of Saudi Arabia

The Color Computer can be used with just about any disk drive, though you must have a disk controller that supports the drive you want to use. Unfortunately drive controllers for the CoCo have become mighty scarce. Most any printer can be used with the Color Computer. Several RAINBOW advertisers offer disk-drive systems and printers for the CoCo — contact these companies for specific information. We called Tandy Corporation in Fort Worth and were told there is an outlet in Hofuf.

It's in There!

Editor:

When I bought a 512K CoCo 3 from Microcom, included was a Performance Peripherals Memory Test program (on disk) that detects no memory errors in the 512K machine. However, when I first turn on the computer and enter `PRINT MEM`, the screen indicates the available memory is only 22,824. That is less than the 24,872 start-up memory a straight 128K CoCo 3 has and far less than 512K. The Microcom representative I consulted about this strange situation could not give me a reason for it but said their own 512K CoCo 3 does the same thing. Can you tell me why the computer gives this misleading information; and is there a way I can find out the current memory available, if I need to, when I am using the computer?

Frank Price, Jr.
1420 Pilot Drive
Cookeville, TN 38501

Your CoCo 3 is normal. The 68B09E microprocessor used in the Color Computer 3 provides a 16-bit address bus, which means the chip can have only 64K in its address space at any point in time. The CoCo 3 uses some fancy memory-mapping techniques to gain access to larger amounts of memory.

When you turn the computer on, much of the upper 32K of the mapped 64K space is reserved for the BASIC interpreter. In addition, several blocks in the lower half are allocated for tasks other than BASIC programs. The end result is that you get 22,824 bytes of free memory from a disk-based CoCo. (Try plugging the disk controller into that 128K machine and you'll get only 22,824 bytes free — the disk controller eats about 2K.) Programmers can take advantage of the full memory complement using "bank-switching" techniques, but BASIC itself does not internally support any way to gain more than about 32K for programs. `PRINT MEM` reports only the memory available for BASIC programs.

Multicolumn Directories Revisited

Editor:

The April 1992 issue of THE RAINBOW includes an article on multicolumn directories (Page 10). It may be of interest to you and others that there are three other "one-liner" commands for performing similar functions. The command line

```
WIDTH 40:POKE &HFE04,20:DIR
```

generates a two-column directory of the disk in the default drive on a 40-column screen. Use a valid drive number (0 through 3) after `DIR` to get directory listings for other drives. Always press CLEAR after using this command and before any other two-column listings or screen printing. Use the `WIDTH` command to return the screen to normal operation.

The second one-liner command similarly generates a two-column directory listing on an 80-column screen:

```
WIDTH 80:POKE &HFE04,40:DIR
```

The third command line

```
WIDTH 80:POKE &HFE04,20:DIR
```

can be used to list a directory in four columns on an 80-column screen. The second and third command lines above do not require that you press CLEAR when you are finished.

George Bethea, Jr.
1 South Lawrence Avenue
Elmsford, NY 10523-2213

Ghana Bwana on the CoCo 3?

Editor:

I have both a CoCo 2 and a CoCo 3. I originally purchased *Ghana Bwana* for use on my CoCo 2 and would like to use it on the CoCo 3 if possible. Is there a patch to make *Ghana Bwana* work on the CoCo 3?

Jim Ferrett
1806 Jefferson Street
S. Greensburg, PA 15601

You're in luck! Such a patch, written by Steve Bjork, appears in the form of a BASIC program listing on Page 74 of the May 1991 issue of THE RAINBOW. This patch is also available for downloading from the CoCo SIG on Delphi.

CoCo 3 with a CoCo 2 Drive?

Editor:

I recently bought a Color Computer 3 with a disk drive. The problem is that the disk drive is not reading disks at all. I was told by Radio Shack that this drive is for a CoCo 2. Why won't this drive work on any CoCo, and where can I buy the right disk drive?

Celso Caballero
1064 N. 125th Apt. A
Layton, UT 84040

There is no distinction between a CoCo 2 drive and a CoCo 3 drive. Any Radio Shack disk drive system that will work with the CoCo 2 will also work with the CoCo 3. (However, older CoCo 1 disk controllers require 12 volts, which isn't supplied by either the CoCo 2 or CoCo 3.) Assuming your CoCo 3 wasn't in the high-speed mode when you saved the programs and files your system can't read (the high-speed mode often garbles data, making it unreadable), we would suspect a physical problem in the drive or disk controller.

CoCo Club Linkup

Editor:

Recently I had occasion to write to all the CoCo Clubs listed in THE RAINBOW. I received two letters that were undeliverable. I would appreciate a letter from any members of the Tucson Color Computer Club or the Marysville Club.

David Graham
P.O. Box 10552
Enid, OK 73706

Artifact Color and the CM-8

Editor:

I recently purchased a CM-8 monitor and find I am unable to see color when running *Mickey's Space Adventure*, *Donald Duck's Playground* or *Winnie The Pooh*. These programs are trademarked by Sierra On-line.

I wrote a letter to Sierra a couple of months ago to see if there is any way I can run the programs in color on this monitor, but I have not yet received a reply. I decided that perhaps the readers of THE RAINBOW could help in some way. If any of you know of patches for these programs (and where they are available), I would appreciate hearing from you.

I like the new concept created for the magazine. It is not as easy to store as previous issues, but at least we are still uppermost in the minds of THE RAINBOW staff. That is more than I can say about some of the other vendors, who quickly turned their backs on us. Because of the lack of support shown by them, we need you more now than we ever did. Keep up the good work.

Cliff De Boer
1435 Ohio Street
Racine, WI 53405

Double-Sided Woes

Editor:

I have been a RAINBOW reader for about four years and would be lost without it. I enjoy THE RAINBOW very much.

I have a CoCo 3 with an FD-502 double-sided disk-drive system. My problem is that I cannot seem to configure a 40-track system disk under OS-9 Level II. I have followed the directions (THE RAINBOW, December 1988, Page 186) without success.

The first disk boots fine with 35 tracks, and I can format a disk with 40 tracks. I then use cobbler to put the OS-9 boot on the second disk and use `dsave /d0 /d1 ! shell` to install the rest of the directories and files. But the disk won't boot. Can you help? Do I have to have 512K to make it work?

Clifford Ernst
Route 1, Box 84
Audubon, MN 56511

See "OS-9 Hotline" on Page 17 of this issue for information about creating bootable double-sided, 40-track systems disks with OS-9 Level II.

THE RAINBOW welcomes letters to the editor. Mail should be addressed to: Letters to Rainbow, The Falsoft Building, 9509 U.S. Hwy 42, P.O. Box 385, Prospect, KY 40059. Letters should include the writer's full name and address. Letters may be edited for clarity or to conserve space.

Letters to the editor may also be sent to us through our Delphi CoCo SIG. From the CoCo SIG> prompt, enter `RAI` to get to the Rainbow Magazine Services area of the SIG. At the RAINBOW> prompt, enter `LET` to reach the LETTERS> prompt, then select Letters for Publication. Be sure to include your complete name and address.

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ISSUE #107, MAY, 1991
DESERT STORM
BUSSINESS PLAN
ULTIMATE RULER
MATH DERBY
BLOOD PRESS.3
COBRA ATTACK
MONOGRAM
COUNTRY CLUB
SCREEN BLANKER
COLOR CLUE

ISSUE #108, JUNE, 1991
SOUND GENERATOR
HIDE DIRECTORY
LOST TREASURE
CLUB REGISTER
SNACK SHACK
CIVIL WAR 3
SPELLING QUIZ
CCO 3 CLOWN
QUICK 3
BLACK BEARD

ISSUE #109, JULY, 1991
DEST. UNKNOWN
FAX COVERSHEET
FISHERMAN'S QUIZ
BETTING ODDS 3
COCO 3 CHESS 2
TV SCRABBLE
FORM LETTER
DIVIDING FRACTIONS
KEYBOARD PROTECT
CUTHBERT

ISSUE #110, AUG., 1991
WEDDING PLANNER
PALIDIN LEGEND
TO-DO LIST
PRINTER GRAPHICS 3
OLD-TIME SCALE
MULTIPLY FRACTIONS
SIEGE ON SIRIUS 3
DISKBASE 3
BIORHYTHMIC THEORM
BUZZ-1

ISSUE #111, SEPT. 1991
PERSONAL FILE
QUEST OF CHAOS
RETIREMENT ACCT.
ALPHABET SCRAM. 3
POKER 3
FINANCE BUNDLE
SILENCE SYNDROME
MR. BILL
COAST TO COAST
OUTLAWS

ISSUE #112, OCT., 1991
BOWLER'S HELPER
POOL PLAYER
MUSIC MAN
GUEST LIST
SERPENT
FOWARD DICE
COCO TOOLS
PAKFIX
GNOME QUEST
DISKS

ISSUE #113, NOV. 1991
GRADE BOOK
BINGO CALLER
CAVERNS OF OH NO
BEAUTY PAGEANT
TELESALE
CRYPTO
CRIONAUNT WARIOR
PICTURE 3
SOLITAIRE PUZZLE
DISKS

ISSUE #114, DEC. 1991
BORDER DESTROYER
LOW RES 1 + 2
THE CASTLE
SKETCH IV
ENEMY ATTACK
MATH SOLVER 2
DREAM ESCAPE AD.
TEST MAKER
CODES A CODES 3
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M2 - 17 Musics Files
M3 - 16 Musics Files
M4 - 16 Musics Files
M5 - 25 Orchestra Files
M6 - 23 .Bin Files ready to play
M7 - 23 .Bin Files ready to play

GAMES 1-11
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GA5 - Battleship, Chicken, Raceway, Lizer, +
GA6 - Kings Army, Navyguns, Shipsub, Shuffle, +
GA7 - Connect 4, F-16, Pizza, Rubic, Life +
GA8 - Football, Germ Attack, Othello, Slither, +
GA9 - Battle, 3DTTT, Max Graphics, Prix, +
GA10 - Blockade, Life, Missile2, Scrabble, +
GA11 - Bunker 3, Trek, Nuke Attack, Traders, +

HOME MANAGEMENT 1-4
*12 Programs Each Disk/Tape
H1 - Chkbook, Wrtprnc, Typing Tutor, +
H2 - Check, Last Will, Word Processor, +
H3 - Envelope, Life, Finance, Interest Rate, +
H4 - Speeling Fix, Spelling Checker, +

Telecommunications 1-3
T1 - Haysae, Kermit, Mikeyterm,
Teleterm
T2 - Cobbs BBs Terminal Package
T3 - Geterm Communications

Utilites 1-8
12 Programs Each, U1-U4 Require Disk
U1 - 105DT, Disk Zapper, Rom Copy, Basic Map, +
U2 - Backup, Diskfast, Customize, Offset, Backdir, +
U3 - Convert, Disk Library, C64pic, Relocate, +
U4 - Bin>Basic, Disk Master, Unsave, Zap, Unlock, +
U5 - Assembler, Basic 64, 51x34, Recover, +
U6 - 64 Look, HGR Color, LLIST 32, Recover, +
U7 - Letter head print with 30 mini pictures
U8 - Fig Forth language with tutorials!

Education 1-4
E1 - 12 Programs for young kids
E2 - 12 Programs for High School Kids
E3 - 11 Programs Teach Coco commands
E4 - 5 Graphic Programs About Australia

Graphics 1-14
GR1 - Raindrop, Celtic, Space +
GR2 - Donald, Snoopy, Worldmap, +
GR3 - 9 Coco 3 Graphic programs
GR4 - 22 Coco Max Pictures
GR5 - 22 Coco Max Pictures
GR6 - 22 Coco Max Pictures
GR7 - 15 Coco Max Pictures
GR8 - 22 .BIN Pictures
GR9 - 22 .BIN Pictures
GR10 - 14 Large .BIN Pictures
GR11 - 8 MGE Pictures
GR12 - Coco Max 3 Pictures
GR13 - Macpaint Graphic Editor
GR14 - 5 Macintosh Pictures

Adventures 1,2
A1 - CIA, Death Ship, Gargoyle, Kingdom, Kingtut - Odeysey, Nuclear Sub, Werewand, Willasdv
A2 - Andrea Doria, Curse, Ghostship, Hogjowl - Icewar, Quest, Sorcerer, Survival, Adv. Gen.

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8 23 38 53 68 85 98 113
9 24 39 54 69 84 99 114
10 25 40 55 70 85 100 115
11 26 41 56 71 86 101
12 27 42 57 72 87 102
13 28 43 58 73 88 103
14 29 44 59 74 89 104
15 30 45 60 75 90 105

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GR2 M2 U2 GA2
GR3 M3 U3 GA3
GR4 M4 U4 GA4
GR5 M5 U5 GA5
GR6 M6 U6 GA6
GR7 M7 U7 GA7
GR8 U8 GA8
GR9 H1 GA9
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Feature Program

Base Conversions Simplified

Most computer users and programmers at some point find it necessary to convert values from one number system to another. The problem is that converting between number systems often involves some unwieldy (albeit simple) calculations.

When the programmers at Microsoft wrote BASIC for the Color Computer, they included a couple of features that make conversions between decimal (base 10) and Hex (base 16) values fairly easily. To convert a decimal value to Hex, you can enter `?HEX$(xxxx)`, where *xxxx* is the decimal representation for the number. (The ? symbol is shorthand for PRINT in the CoCo's BASIC.) To get from Hex to decimal, you can enter `?&Hyyyy`, where *yyyy* is the hexadecimal number you want to convert.

Unfortunately, however, Microsoft did not include support for binary (base 2) numbers, and the HEX$ function can't handle numbers larger than $FFFF (decimal 65535). This poses a problem for CoCo 3 owners, whose computers have more than 64K of memory. I wrote *Convert* to overcome these limitations.

Convert is a simple CoCo 3 utility designed to convert values between decimal, hexadecimal and binary. Since it uses 80 columns, you'll need a monochrome or RGB monitor to see the text onscreen. When you run the program, you'll see the message PRESS ENTER TO ACTIVATE blinking near the middle of the screen. Above this are the words Hexadecimal, Decimal and Binary, and an arrow points to Hexadecimal. Use the right and left arrow keys to move the arrow so it points to the name of the number system from which you want to convert (the input base), then press ENTER.

When you have selected an input base, the cursor moves to the input box at the lower-left portion of the screen. The limits for the input base you have selected are also displayed in the box. Simply enter the number you want to convert. About a second later, you'll hear a beep and the number is displayed in all three bases on the lower-right portion of the screen.

After the results are displayed, the original value disappears from the input box and the cursor returns. If you want to continue converting numbers from the selected system, simply enter another number. To change to another input base, press ENTER by itself and the cursor is returned to the top part of the screen. To exit from *Convert*, hold SHIFT and press BREAK.

All three input bases are selective, which means the program will not accept values that do not fit the selected base. In other words, the decimal input base won't allow you to enter a value that contains any alphabetic (usually implying Hex) characters.

The input range for the decimal base is 0 through 1048575. The Hex input range is limited to values between $00000 and $FFFFF, and the binary converter accepts values from 0 through 1111 1111 1111 1111 1111. Leading zeros are not needed for any input base. When entering binary values, you can use periods anywhere in the number. However, *Convert* does not perform fractional conversions — the fractional portion of, say, 123.52 is truncated before the conversion.

The strange character that looks like a rooftop (^) in some of the program lines is called a caret. It is used by many computers to indicate the mathematical operation of raising a number to a power (e.g., 3^2 is the same as 3^2, which is 9). You can generate this character from the CoCo keyboard by pressing the up arrow.

George Quellhorst has owned and used Color Computers since their introduction, and he especially enjoys writing programs for his CoCo 3. George may be contacted at 203B Meadows Drive, Painesville, OH 44077-5361, (216) 354-3812. Please include an SASE when requesting a reply.

CoCo 3

The Listing: CONVERT

```
1 'BASE CONVERTER
2 'BY GEORGE QUELLHORST
3 'COPYRIGHT (C) 1992
4 'BY FALSOFT, INC.
5 'RAINBOW MAGAZINE
10 ' CONVERSIONS. By: George Que
llhorst. Latest update: 12/05/19
90
20 POKE65497,.:RGB:CLEAR2000:PAL
ETTE0,56:PALETTE2,63:PALETTE3,8:
PALETTE8,8:PALETTE9,32:WIDTH80:C
LS1:POKE140,180:EXEC43350:S$=CHR
$(252):POKE63372,65:POKE65434,56
:POKE&HF80F,0:POKE&HF84F,0:POKE&
HF89C,0:POKE41598,255:ONBRKGOTO5
50
30 LOCATE3,1:ATTR0,0:PRINT"C O N
 V E R S I O N S  -  BY: GEORGE
QUELLHORST  -  C O N V E R S I O
N S";:LOCATE3,2:PRINTSTRING$(73
,45)
40 LOCATE10,4:ATTR1,0:PRINT"UP/A
RROW POINTS TO INPUT BASE IN EFF
ECT AFTER PRESSING ENTER";:LOCAT
E6,6:PRINT"H E X A D E C I M A L
":LOCATE38,6:PRINT"D E C I M A L
":LOCATE63,6:PRINT"B I N A R Y"
50 LOCATE3,12:ATTR1,0:PRINT"PRES
S ENTER ONLY TO SWITCH INPUT BAS
E";:LOCATE55,12:PRINT"RETURN VAL
UES:";:X(1)=15:X(2)=43:X(3)=67:Y
=7:LOCATE15,Y:ATTR3,3:PRINT" ^ "
::ATTR0,0:P=1
60 LOCATE42,14:PRINT"DECIMAL....
:";:LOCATE42,17:PRINT"BINARY....
.:";:LOCATE42,20:PRINT"HEXADECIM
AL:";:LOCATE3,22:PRINTSTRING$(73
,45);:LOCATE25,23:ATTR1,0:PRINT"
PRESS SHIFT / BREAK TO ESCAPE";
70 LOCATE13,9:ATTR0,0:PRINT"USE
LEFT AND RIGHT ARROWS TO CHOOSE
DESIRED INPUT BASE";:FORT=12TO21
:LOCATE40,T:PRINTS$;:NEXTT:LOCAT
E3,11:PRINTSTRING$(73,45);
80 ' Input mode select.
90 LOCATE28,10:ATTR1,1,B:GOSUB54
0
100 P$=INKEY$:IFP$=""THEN100
110 IFPEEK(344)=247THENEXEC:P=P+
1:IFP>3THENP=1
120 IFPEEK(343)=247THENEXEC:P=P-
1:IFP<1THENP=3
130 FORT=1TO3:LOCATEX(T),Y:ATTR2
,0:PRINT"  ";:NEXT:LOCATEX(P),Y:
ATTR3,3:PRINT" ^";:ATTR1,0
140 IFP$=CHR$(13)THENEXEC:LOCATE
X(P),Y:ATTR3,3:PRINT" ^";:LOCATE
28,10:ATTR0,0:GOSUB540:GOTO150EL
SE100
150 ON P GOSUB 190,240,280
160 IFP=1THENGOSUB430:D=A:GOSUB4
50:GOTO170ELSEIFP=2THENA=D:GOSUB
400:GOSUB450:GOTO170ELSEIFP=3THE
NGOSUB350:A=D:GOSUB400
170 GOSUB520:GOSUB530:GOTO150
180 ' Hexidecimal input routine.
190 LOCATE5,15:PRINT"PLEASE INPU
T HEXADECIMAL NUMBER";:LOCATE4,1
7:PRINT"MAXIMUM FFFFF - DO NOT I
NCLUDE &H";
200 LOCATE40,19:PRINTS$;:LOCATE1
7,19:LINEINPUTH$:EXEC:LOCATE40,1
9:PRINTS$;:IFH$=""THEN510ELSEIFL
EN(H$)>5THENGOSUB530:LOCATE17,19
:PRINT" ":GOTO200
210 FORT=1TOLEN(H$):Z$=MID$(H$,T
,1):N=INSTR(1,"1234567890ABCDEF"
,Z$):IFN=0THENGOSUB530:LOCATE17,
19:PRINT" ":GOTO200ELSENEXTT
220 HE$=H$:H$="&H"+H$:RETURN
230 ' Decimal input routine.
240 LOCATE6,15:PRINT"PLEASE INPU
T DECIMAL NUMBER";:LOCATE12,17:P
RINT"MAXIMUM 1048575";
250 LOCATE40,19:PRINTS$;:LOCATE1
7,19:LINEINPUTD$:EXEC:LOCATE40,1
9:PRINTS$;:IFD$=""THEN510ELSE D=
VAL(D$):IFD>1048575THENGOSUB530:
LOCATE17,19:PRINT" ":GOTO250
260 RETURN
270 ' Binary input routine.
280 LOCATE7,14:PRINT"PLEASE INPU
T BINARY NUMBER";:LOCATE2,15:PRI
NT"PERIODS AND LEADING ZEROS NOT
 NEEDED";:LOCATE4,17:PRINT"1111.
1111.1111.1111.1111 MAXIMUM";
290 LOCATE40,19:PRINTS$;:LOCATE9
,19:LINEINPUTB$:EXEC:LOCATE40,19
:PRINTS$;:IFB$=""THEN510ELSEIFLE
N(A$)>24THENGOSUB530:LOCATE9,19:
PRINT" ":GOTO290
300 FORT=1TOLEN(B$):A$=MID$(B$,T
,1):IFA$="0" ORA$="1" ORA$="."TH
ENNEXTT ELSEGOSUB530:LOCATE9,19:
```

Feature Program

What's in Disk File?

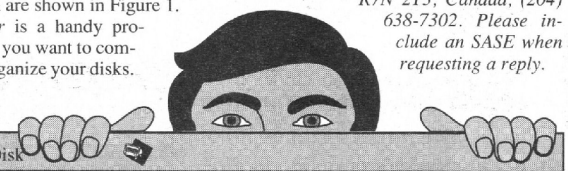
File Peeker is a simple utility program that allows you to examine the contents of disk files using a CoCo 3. Since the program displays the characters in the file in Hex and ASCII forms (where possible), it is useful for comparing files and learning about how programs are stored on disk. A simpler (yet no less important) application of *File Peeker* is for discovering what's in a file when you are organizing your disks.

To get started, enter the program as shown, save it to disk, then run it. When prompted, enter the name of a file (on the disk in the default drive — usually Drive 0) you want to view (use the eight-character filename followed by a period and the three-character extension). Once you press ENTER, *File Peeker* goes to work. On the left side of the screen are the hexadecimal representations for the charcters (bytes) in the file; the ASCII forms of the characters are shown on the right side of the screen. If a byte in the file is less than 32 (decimal) or greater than 127, a period is shown in the ASCII representation.

To peek at a file on a different drive, put *:d* (where *d* is the drive number — 0, 1, 2 or 3) after the filename extension and enclose the whole entry in quotes. For example, to look at a file called JUNKTEXT.DAT stored on a disk in Drive 1, you would enter "JUNKTEXT.DAT:1". Be careful when entering filenames; if you specify a file that doesn't exist, Disk BASIC will create an empty file with the entered name.

If you have some experience with BASIC, you might want to modify the program to allow optional printing on paper. Another possible enhancement is to allow some form of "paging" through the file — as written, *File Peeker* scrolls through the entire file without pausing — instead of using SHIFT-@ to pause the display. The variables used in the program are shown in Figure 1.

File Peeker is a handy program, whether you want to compare files or organize your disks. It should be a useful addition to your CoCo toolbox.



Geoff Friesen has a bachelor of science degree in computer science and mathematics. He is the author of several published articles about computers. He may be contacted at General Delivery, Dauphin, MB R7N 2T3, Canada, (204) 638-7302. Please include an SASE when requesting a reply.

CoCo 3 Disk

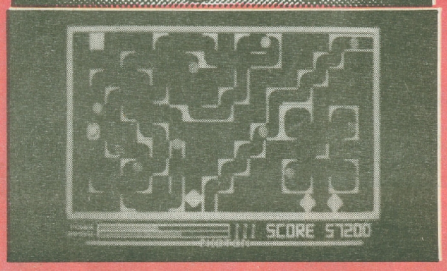
The Listing: FILEPEEK

```
1 'FILE PEEKER
2 'BY GEOFF FRIESEN
3 'COPYRIGHT (C) 1992
4 'BY FALSOFT, INC.
5 'RAINBOW MAGAZINE
100 'FPEEK (FILE PEEKER)
110 '
120 ON BRK GOTO 400
130 S=1
140 BF$="........"
150 WIDTH 40
160 PRINT " FPEEK (FILE PEEKER)"
170 PRINT
180 INPUT " FILE NAME"; F$
190 PRINT
200 OPEN "D",#1,F$,1
210 FIELD #1,1 AS A$
220 FOR I=1 TO LOF(1)
230 GET #1
240 IF A$<" " THEN 270
250 IF A$>CHR$(127) THEN 270
260 MID$(BF$,S,1)=A$
270 B$="0"+HEX$(ASC(A$))
280 PRINT " "+RIGHT$(B$,2);
290 S=S+1: IF S<>9 THEN 330
300 PRINT "       "+BF$
310 S=1
320 BF$="........"
330 NEXT I
340 IF S=1 THEN 400
350 FOR I=1 TO 9-S
360 PRINT "   ";
370 NEXT I
380 PRINT "       ";
390 PRINT MID$(BF$,1,S-1)
400 UNLOAD
```

SUNDOG SYSTEMS

PHOTON

NEW!



Energy is everything; your home world depends on it. However, someone or something is slowly siphoning it away. As your world's champion, you must climb into the experimental Power Tank to challenge this nemesis and his minions. Your key lies with the ability to teleport solid mass. Use this to manipulate and explore the endless stronghold of the enemy, and to exploit the free-floating DUPES (Dense Units of Photon Energy) to destroy the menacing Plasma Droids. Be cautious, though; those DUPES can be deadly, too! Photon, a fantastic new arcade game for your Coco3, contains spectacular 320x200 resolution, 16 color graphics, ultra-smooth 60 Hz animation, and loads of real-time music and sound effects. It will send your mind racing over endless possibilities, requiring quick decisions and reactions. Quite simply, Photon is incredibly addictive; it will deliver hours of excitement. Will you become your world's greatest hero, or just another energy slave? Req. 128K CoCo 3 and disk drive.

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GRAF 2.0 EXPRESS

NEW!

GrafExpress 2.0 is a complete graphics and music programming environment. From the beginner to the accomplished professional, you can use GrafExpress to create lightning fast arcade games, graphic applications and utilities, and windowing multimedia demonstrations! The GrafExpress package includes two incredible systems. GrafExpress 16 works on all monitor types and offers support in 12 graphic resolutions (from 128x192 to 320x225). GrafExpress 256 offers 6 resoutions (from 128x192 to 160x225 on a composite monitor) in an astounding 256 colors! Ever see a CoCo do that before? Both systems include standard graphics commands (CIRCLE, FILL, etc.) that blow away the competition. For example, the BOX command peaks out at over 2 MegaPixels/second; that's 300 times faster than BASIC! 255 separate sprites of up to 100x100 pixels each are supported with window clipping and high-res pixel level collision checking. The 8-octave/4-voice music synthesizer has independent envelope, waveform, and volume controls, a 7 + KHz sampling rate, and much more. Other features include text/graphics mixing, different font sizes, fast window copying and scrolling, picture save/load, easy implementation from both BASIC and assembly language, multiple screen animation, and support for 128K/512K, double speed, and the high-res joystick interface. The package also contains support programs that are worth the purchase price of GrafExpress alone! These include an introductory demo, a picture editor, a waveform editor, and an art program that supports 256 colors! GrafExpress also comes with a 50 page manual that fully explains all of its incredible features. If you do any graphics programming or simply want to see what your little CoCo is capable of, GrafExpress is a must! Req. 128K CoCo 3 and disk drive.

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NEW!

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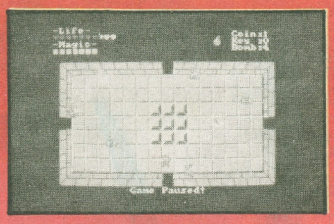
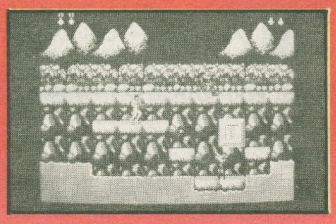


An immensely popular 128K CoCo 3 arcade/adventure. Over 500 screens of fast fantasy action and puzzle solving. Great graphics and sound effects. **$34.95.** Hint book only $4.95.

★ THE CONTRAS ★



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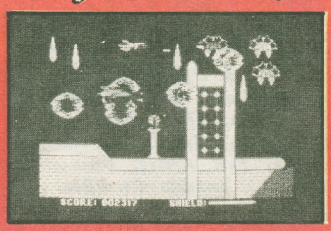

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ZENIX

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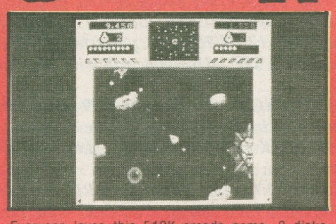

Everyone loves this 512K arcade game. 3 disks packed with spectacular graphics and eerie background digital sound effects. 512K CoCo 3 only. **$34.95.**

KYUM-SAI TO BE NINJA

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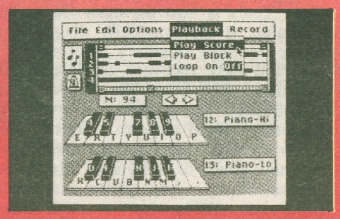
SOUNDTRAK



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Sundog systems

SUNDOG SYSTEMS

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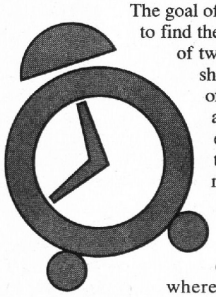
```
PRINT" ":GOTO290
310 N=INSTR(1,B$,"."):IFN=0THEN3
20ELSEB$=LEFT$(B$,N-1)+RIGHT$(B$
,LEN(B$)-N):GOTO310
320 IFLEN(B$)>20THENGOSUB530:LOC
ATE9,19:PRINT" ":GOTO290
330 B$=STRING$(20-LEN(B$),"0")+B
$:RETURN
340 ' Binary to Decimal.
350 D=0:FORT=20TO1STEP-1:A=VAL(M
ID$(B$,21-T,1)):D=D+A*INT(2^(T-1
)):NEXT
360 A$="":N=INSTR(1,B$,"1")-1:B$
=RIGHT$(B$,LEN(B$)-N)
370 IFINT(LEN(B$)/4)<>LEN(B$)/4
THENB$="0"+B$:GOTO370
380 FORT=1TOLEN(B$)STEP4:A$=A$+M
ID$(B$,T,4)+".":NEXT:B$=LEFT$(A$
,LEN(A$)-1):RETURN
390 ' Decimal to Hexidecimal.
400 K=INT(D/256):V=D-(256*K):J$=
HEX$(K):IFV=0THENL$="00"ELSEL$=H
EX$(V)
410 HE$=J$+L$:RETURN
420 ' Hexidecimal to Decimal. In
put &HH$ / Output A
430 A=VAL(H$):RETURN
440 ' Decimal to Binary.
450 IFD>65535THENL=19ELSEIFD>409
5THENL=15ELSEIFD>255THENL=11ELSE
IFD>15THENL=7ELSEL=3
460 A$="":B$="":FORT=L TO 0 STEP
-1:B=INT(D/INT(2^T))
470 IFB=>1 THENA$=A$+"1":D=D-INT
(2^T) ELSEA$=A$+"0"
480 NEXTT:L=LEN(A$)
490 FORT=1TO L STEP4:B$=B$+MID$(
A$,T,4)+".":NEXT:B$=LEFT$(B$,LEN
(B$)-1):RETURN
500 ' Miscellaneous gosubs.
510 Z$=STRING$(36,32):LOCATE1,14
:PRINTZ$;:LOCATE1,15:PRINTZ$;:LO
CATE1,17:PRINTZ$;:LOCATE54,14:PR
INT" ":LOCATE54,17:PRINT" ":LOCA
TE54,20:PRINT" ":GOTO90
520 LOCATE4,19:PRINT" ":LOCATE40
,19:PRINTS$;:LOCATE54,14:PRINTA:
LOCATE55,17:PRINTB$:LOCATE55,20:
PRINTHE$:RETURN
530 POKE140,180:FORZ=1TO25:EXEC:
NEXTZ:RETURN
540 PRINT" PRESS ENTER TO ACTIVA
TE";:RETURN
550 CLS1:POKE41598,3:POKE63372,1
1:POKE65496,0:ATTR0,0:STOP
```

Feature Program

Intersection: A Leisurely CoCo Game

Have you been feeling "under the gun" lately? Tired of playing games where all your actions are timed? Well, here's *Intersection*, a game where you don't have to race against a clock; all you have to do is think a little. In fact, taking your time may actually increase your score with *Intersection*.



The goal of this game is to find the intersection of two lines. Two short segments of the two lines are visible. By extending these segments in your mind, you must locate the location onscreen where the lines meet. Although it may sound easy, finding the right spot can be harder than you might think.

Intersection works on any CoCo with at least 16K and Extended BASIC, and requires a joystick. Enter the listing as shown and save it to tape or disk. When entering the listing, CoCo 3 users must replace lines 1220 and 1580 as follows:

```
1220 IF BUTTON(0)=0 THEN 1220
1580 IF BUTTON(0)=1 THEN 1640
```

While the program is running, the right joystick controls a box, or cursor, which you can move around the rectangular playing field. Outside the playing field are the short segments of the two lines you must "intersect;" one comes from the top of the screen and the other comes from the left. Place the cursor where you think the lines will meet and press the joystick button. If you find the intersection point in the first three attempts, you score points. You receive 50 points if you get it on the first attempt; a correct second attempt earns you 25 points, and 10 points are awarded if you are successful on the third try. There are ten rounds of play.

Some notes of interest about the way the program works are in order. The title screen provides a nice effect by scrolling the word INTERSECT onto the screen. To accomplish this, I first have the program display graphics pages 2 and 3. Then the program sets the computer to PMODE3, which has access to graphics pages 1 through 4. The word INTERSECT is moved downward from the bottom of graphic Page 1 to Page 2, so the word seems to scroll onto the screen from somewhere above.

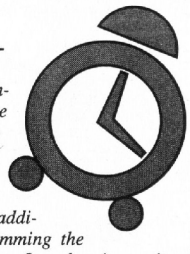
As for the game itself, graphics pages 1 and 2 are displayed. The rectangle around the playing field, the rectangle around the screen, and the two lines to be intersected are kept on pages 3 and 4. Whenever the cursor is moved, pages 3 and 4 are copied onto pages 1 and 2, and the cursor is redrawn. This way movement is smooth and there is no need to worry about erasing the cursor from its old position.

Other parts of the program are best described by explaining key variables. Variable Q contains the graphics for the word INTERSECT, which scrolls onto the title screen. FIRST has a value of 1 only before the first game is played, and is zero at all other times. This is to make sure the score shows up on the title screen only after at least one game has been played. Array S$ (0-9) contains the DRAW strings for the numbers 0 though 9. S1, S2 and S3 are the hundreds, tens, and ones digits of SCORE. For example, if SCORE equals 425, then S1 is 4, S2 is 2 and S3 is 5. The score is broken up this way to make using the strings in S$ easier.

HBOX and WBOX control the size of the cursor. HDELTA and WDELTA control the size of the playing field. The lines that are to be intersected have endpoints (0,A) and (B,0). They meet at the intersection point given by (CX,CY).

Simple changes you might try include modifying the values of HBOX in Line 1270 and HDELTA in Line 1290. Increasing the value in either (or both) of these variables makes the game easier. A useful addition to the game would be some way to track the high score and display it on the title screen. If you are really into timed games, try adding routines so that the score depends on how fast the 10 intersections are found. (This would probably be easiest using the TIMER function.)

Hopefully you'll enjoy *Intersect*. A perfect score is 500 points, though you'll need to be very lucky and skilled to get this score. And remember, using rulers to locate intersections is not permitted. Good luck!



Joseph Pendell has a degree in electrical engineering from the University of Maryland. In addition to programming the Color Computer, Joseph enjoys using the Macintosh. His hobbies include riding skateboards and playing Super Nintendo.

16K Extended

The Listing: INTRSECT

```
1 'INTERSECTION
2 'BY JOSEPH PENDELL
3 'COPYRIGHT (C) 1992
4 'BY FALSOFT, INC.
5 'RAINBOW MAGAZINE
10 R=RND(-TIMER)
20 CLEAR 500
30 DIM Q(225)
40 FIRST=1
50 PLAY"L255T255"
60 'TEXT "0" TO "9"
70 S$(0)="U6R4D6L4BR7"
80 S$(1)="R4L2U6G2BD4BR7"
90 S$(2)="NR4U3R4U3L4BR7BD6"
100 S$(3)="R4U3NL3U3L4BR7BD6"
110 S$(4)="BU6D3R4U3D6BR3"
120 S$(5)="R4U3L4U3R4BR3BD6"
130 S$(6)="R4U3L4D3U6R4BR3BD6"
140 S$(7)="BU6R4D6BR3"
150 S$(8)="R4U3L4U3R4D3L4D3BR7"
160 S$(9)="R4U3L4U3R4D6BR3"
170 PMODE 3,1
180 PCLS
190 PMODE 1,2
200 SCREEN 1,0
210 PMODE 3,1
220 'TEXT "INTERCEPT"
230 P$="S7R11L6D14L6R11BR7"
240 P$=P$+"U14M+11,+14U14BR6"
250 P$=P$+"R11L6D14BR11"
260 P$=P$+"NR11U7NR7U7R11BR6"
270 P$=P$+"ND14R8F3D2G3L8R6F5D2B
R6"
280 P$=P$+"BU2F2R7E2U4H2L7H2U3E2
R7F2BU2BR6"
290 P$=P$+"NR11D7NR7D7R11BR6"
300 P$=P$+"BU2BR11G2L7H2U9U2E2R7
F2BU2BR6"
310 P$=P$+"R11L6D14"
320 DRAW"C3"
330 FOR I=2 TO 6
340 DRAW"BM"+STR$(I)+","+STR$(I)
+";XP$;"
350 NEXT I
360 DRAW"C4BM7,7;XP$;"
370 GET(0,0)-(255,33),Q,G
380 'START OF TITLE SCREEN ROUTI
NE
390 FOR I=18 TO 48 STEP 2
400 PUT(0,I)-(255,I+33),Q
410 NEXT I
420 PMODE 0,3
430 PCLS
440 PMODE 1,3
450 IF FIRST=1 THEN 750
460 'CREATE BOX TO GO AROUND SCO
RE
470 DRAW"BM60,109S4C4NH10R128NH1
0D20L128NU20H10U20R128"
480 PAINT(62,110),2,4
490 PAINT(62,104),2,4
500 PAINT(56,110),2,4
510 'TEXT "SCORE"
520 DRAW"BM70,113C4SBR2NF1L2G1D1
F1R2F1D1G1L2NH1BR5"
530 DRAW"BR1R2NE1L2H1U4E1R2F1BU1
BR2"
540 DRAW"BR1R2F1D4G1L2H1U4E1BR5"
550 DRAW"ND6R3F1D1G1L2R1F2D1BR2"
560 DRAW"NR4U3NR3U3R4BR2BD6"
570 DRAW"BR8C3"
580 'ISOLATE DIGITS OF SCORE AND
 DISPLAY THEM
590 S1=INT(SCORE/100)
600 S2=INT((SCORE-S1*100)/10)
610 S3=SCORE-S1*100-S2*10
620 DRAW"XS$(S1);XS$(S2);XS$(S3)
;"
630 PCOPY 4 TO 3
640 IF SCORE<500 THEN 750
650 'SPECIAL EFFECTS FOR GETTING
 A PERFECT SCORE
660 PMODE 1,2
670 PLAY"V15"
680 FOR I=1 TO 10
690 PLAY"CDEFGAB"
700 SCREEN 1,1
710 PLAY"CDEFGAB"
720 SCREEN 1,0
730 NEXT I
```

```
740 PMODE 1,3
750 'NORMAL TITLE SCREEN SOUNDS
760 PLAY"V1"
770 FOR I=1 TO 15
780 PLAY"CEGV+"
790 NEXT I
800 FOR I=1 TO 15
810 PLAY"BDFV-"
820 NEXT I
830 DRAW"C4S8BM46,173
840 'TEXT "PRESS"
850 DRAW"U6R3F1D1G1L2BD3BR5"
860 DRAW"U6R3F1D1G1L2R1F2D1BR2"
870 DRAW"NR4U3NR3U3R4BD6BR2"
880 DRAW"BU1F1R2E1U1H1L2H1U1E1R2
F1BD5BR2"
890 DRAW"BU1F1R2E1U1H1L2H1U1E1R2
F1BD5BR2"
900 DRAW"BR4"
910 'TEXT "JOYSTICK"
920 DRAW"BU1F1R2E1U5BR2"
930 DRAW"BD1E1R2F1D4G1L2H1U4BU1B
R6"
940 DRAW"M+2,+3NM+2,-3D3BR4"
950 DRAW"BU1F1R2E1U1H1L2H1U1E1R2
F1BU1BR2"
960 DRAW"R4L2D6BR4"
970 DRAW"R4L2U6L2R4BR2"
980 DRAW"BR1R2NF1L2G1D4F1R2NE1BR
3"
990 DRAW"U6D3NE3F3BR2"
1000 DRAW"BR4"
1010 DRAW"BM40,191"
1020 'TEXT "BUTTON"
1030 DRAW"U6R3F1D1G1NL2F1D1G1L3B
R6"
1040 DRAW"BU1NU5F1R2E1U5BD6BR2"
1050 DRAW"BU6R4L2D6BR4"
1060 DRAW"BU6R4L2D6BR4"
1070 DRAW"BU1F1R2E1U4H1L2G1D4BD1
BR6"
1080 DRAW"U6M+5,+7NU6BR2"
1090 DRAW"BR4"
1100 'TEXT "TO"
1110 DRAW"BU6R4L2D6BR4"
1120 DRAW"BR1H1U4E1R2F1D4G1L2BR5
"
1130 DRAW"BR4"
1140 'TEXT "START"
1150 DRAW"BU1F1R2E1U1H1L2H1U1E1R
2F1BU1BR2"
1160 DRAW"R4L2D6BR4"
1170 DRAW"U4E2F2D1NL4D3BR3"
1180 DRAW"U6R3F1D1G1L2R1F2D1BR2"
1190 DRAW"BU6R4L2D6"
1200 PCOPY 4 TO 3
1210 'WAIT UNTIL FIRE BUTTON IS
PUSHED
1220 IF PEEK(65280)<>126 AND PEE
K(65280)<>254 THEN 1220
1230 FIRST=0:'DISPLAY SCORE AFTE
R NEXT GAME
1240 XOLD=1000
1250 YOLD=1000
1260 DLAY=10
1270 HBOX=20
1280 WBOX=4/3*HBOX
1290 HDELTA=40
1300 WDELTA=4/3*HDELTA
1310 GOSUB 2110
1320 SCORE=0
1330 TRIES=0
1340 ROUND=0
1350 PMODE 1,1
1360 PCLS
1370 SCREEN 1,0
1380 'CREATE GAME SCREEN
1390 PMODE 1,3
1400 PCLS
1410 A=RND(191)-1
1420 B=RND(256)-1
1430 CX=RND(255-WDELTA)+WDELTA
1440 CY=RND(190-HDELTA)+HDELTA
1450 COLOR2,1
1460 LINE(0,A)-(CX,CY),PSET
1470 LINE(B,0)-(CX,CY),PSET
1480 LINE(WDELTA,HDELTA)-(255,19
1),PRESET,BF
1490 COLOR 3,1
1500 LINE(WDELTA,HDELTA)-(255,19
1),PSET,B
1510 LINE(0,0)-(255,191),PSET,B
1520 PMODE 1,1
1530 PCOPY 3 TO 1
1540 PCOPY 4 TO 2
1550 COLOR 4,1
1560 LINE(JX,JY)-(JX+WBOX,JY+HBO
X),PSET,B
1570 GOSUB 2110
1580 IF PEEK(65280)=126 OR PEEK(
65280)=254 THEN 1640
1590 IF XOLD=JX AND YOLD=JY THEN
 1570
1600 'JOYSTICK POSITION CHANGED,
 NEED TO UPDATE
1610 XOLD=JX
1620 YOLD=JY
1630 GOTO 1530
1640 'PUSHED BUTTON, CHECK IF AT
 INTERSECTION
1650 IF CX<JX OR CY<JY OR CX>JX+
WBOX OR CY>JY+HBOX THEN 1910
1660 'GOT IT
1670 TRIES=TRIES+1
1680 FOR I=1 TO TRIES
1690 SOUND 100,1
1700 FOR J=1 TO DLAY
1710 NEXT J,I
1720 IF TRIES=1 THEN SCORE=SCORE
+50
1730 IF TRIES=2 THEN SCORE=SCORE
+25
1740 IF TRIES=3 THEN SCORE=SCORE
+10
1750 ROUND=ROUND+1
1760 'SHOW INTERSECTION
1770 COLOR 4,1
1780 PCOPY 3 TO 1
1790 PCOPY 4 TO 2
1800 LINE(JX,JY)-(JX+WBOX,JY+HBO
X),PSET,B
1810 COLOR 2,1
1820 LINE(0,A)-(CX,CY),PSET
1830 LINE(B,0)-(CX,CY),PSET
1840 FOR I=1 TO 50
1850 PRESET(CX,CY)
1860 PSET(CX,CY,2)
1870 NEXT I
1880 TRIES=0
1890 IF ROUND=10 THEN 1990
1900 GOTO 1380
1910 'MISSED IT
1920 TRIES=TRIES+1
1930 FOR I=1 TO TRIES
1940 SOUND 1,1
1950 FOR J=1 TO DLAY
1960 NEXT J,I
1970 IF TRIES<3 THEN 1590
1980 GOTO 1750
1990 FOR I=1 TO 1500
2000 NEXT I
2010 'GET READY FOR TITLE SCREEN
2020 PMODE 1,2
2030 PCLS
2040 SCREEN 1,0
2050 PMODE 0,1
2060 PCLS
2070 PMODE 0,4
2080 PCLS
2090 PMODE 3,1
2100 GOTO 380
2110 'FIND OUT WHERE TO PUT CURS
OR ACCORDING TO JOYSTICK
2120 JX=JOYSTK(0)/63*(255-WDELTA
-WBOX)+WDELTA
2130 JY=JOYSTK(1)/63*(190-HDELTA
-HBOX)+HDELTA
2140 RETURN
```

Product Review

4D Checkers: On the Level

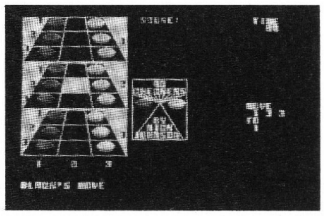
The idea behind *4D Checkers*, a CoCo 3 game from N*Johnson Software (Nick Johnson), is a very good one. Imagine a stack of three 3-by-3 grids with nine black and nine red checkers distributed among the levels. Now add a wildcard "transport square" for a little spice. What you're probably seeing in your head looks something like a cross between tic-tac-toe and checkers — with hints of pieces "beaming" across the ether (just remembering the chess scenes from old *Star Trek* episodes).

That's just about the image I had in my head when I received *4D Checkers* for review. After playing for a few minutes, I scaled down my expectations. It's not that the game is bad — it isn't. *4D Checkers* simply fails to live up to its potential. First let's talk about the game, then I'd like to make some suggestions to Mr. Johnson, because I really like his concept.

4D Checkers plays like traditional checkers in the sense that it requires two players, and the checkers move one space at a time and can capture other checkers by jumping them to a blank square. After a red piece jumps a black piece, for instance, the black piece is removed from the board and the red player receives a point. The goal is to get rid of *all* the other player's checkers. There the similarity to regular checkers ends.

In *4D Checkers* the board is smaller, you can't be kinged, and pieces can move (and jump) in any direction — vertical, horizontal or diagonal — while traditional checkers are limited to diagonal movement. Then of course there's *4D Checkers*' most interesting feature, which traditional checkers lacks: the flashing yellow transport square.

After you move a piece onto the transport square, it mystically reappears somewhere else; relocation on any of the three levels is possible. If your transporting checker lands on a piece belonging to the other side, the opponent's piece disappears and you gain a point. If you land on one of your own checkers, you lose that piece and also the point. If you land on a blank square, no points are gained or lost. Be careful when transporting: blind chance may place you in a position to make a jump, or it may transport you into peril. In the most difficult level of play, the transport square is invisible, which makes for some surprising moves.



A coordinate system is used to tell the computer how to move — three numbers for level, column and row. You type the coordinates of the piece to be moved, then type the coordinates of the destination square. If you mess up, you can't backspace to correct your mistake but must press the CLEAR key to start over. If you have a Speech/Sound Cartridge, you can hear the computer tell you when you are trying to make an illegal move. The SS/C routine also announces whose turn it is, when time is up and who won the game.

Now for the suggestions. Mr. Johnson, most people who play board-type games on their computers don't bring along a friend (I had to find someone to sit at my cramped computer desk in order to help me review this). I would like to see a one-player mode in which the player could take on the computer. [*Editor's Note: Mr. Johnson has informed us a version supporting a one-player mode is near completion.*] Also, the image of the three boards, which now takes up just the upper-left corner of the screen, would look better if expanded to fill most of the screen. Finally, the red and black pieces are just about impossible to distinguish on the old monochrome monitor I hooked up (though the colors show up fine on my RGB).

Your game is all right as is, Mr. Johnson — no bugs could I find — but I think it could be much better. *(N*Johnson Software, 5830A Reinke Drive, Crestview, FL 32536, (904) 682-2907; $14.95.)*

— Margaret Gividen

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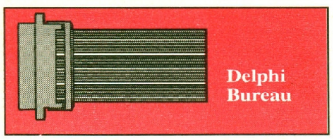


Databases Fixed

The OS-9 SIG rearrangement is finally complete!

The OS-9 SIG databases are now in their final form. The only change left remaining is fixing the keywords in certain databases; even that should be finished by the time this reaches print. Figure 1 shows the databases in their final form.

Notice that there are two versions of the Applications, Telecom and System Modules databases: one for the CoCo and other 6809-based machines (6809) and another for 680x0-based machines (OSK). The other databases are shared between 6809 and 680x0 machines. Next month I'll give a quick description of what belongs in each database so you'll know where to look when trying to find a file.

General Information
Applications (6809)
Telecom (6809)
System Modules (6809)
Games & Graphics
Music & Sound
Programmers Den
OSK Applications
OSK Telecom
OSK System Modules
Tutorials & Education
Standards
New Uploads

Figure 1: New Database Topics

Editing Online

Remember last month I described host echo and how to turn it on and off. Now I'll describe EDT (the standard VAX/VMS editor) in normal and full-screen mode. EDT can be used in your workspace when submitting a file to the database, sending mail, or sending a forum message.

Before continuing, I should explain how to select your default editor. From any SIG prompt, type:

```
OS9> set

PREFERENCES> editor
Current Editor Preference: (no preference)
Would you like to change it? (Y/N) y
Here are your choices:
OLDie is a simple line numbered editor.
EDT is a more powerful editor with optional VT100 full screen mode.
If you don't specify a preference, EDT will be selected for you if needed.
Enter OLDIE, EDT, or press RETURN: edt
Your record has been updated!

PREFERENCES> ^Z

OS9>
```

I selected EDT as my default editor. Remember that I could also have typed `SET EDITOR` at the `OS9>` prompt to choose my editor. (From most places on Delphi, you can combine several commands on one line.) The messages above state that EDT is the default editor unless you specifically chose one, so you may not need to enter these commands. To see your current editor setting, enter:

```
OS9> /edit
/EDITOR = EDT
OS9>
```

You can also use this slash command to change your editor for the duration of this session by typing `/EDIT EDT`. (You make this temporary setting permanent by entering the `/SAVE` command.) As you can see, there is always more than one way to do what you need to do. Choose the method you find easiest.

Now let's get back to editing. You have selected EDT as your default editor. Now what? Well, let's send a forum message and edit it. Let's start at the forum prompt. Assuming I've just read Message 54025 and I want to reply to it, I can type:

```
FORUM> file temp.txt
Filing 54025
Message written to new file TEMP.TXT

Press RETURN to resume "READ 54025:"
```

I just wrote the contents of Message 54025 into the file named `TEMP.TXT` in my workspace. Why did I do this? I want to include part of the text of the message to which I'm replying.

```
FORUM> reply
To: [PHILSCHERER]
Subj: RE: C
Please enter your message below. Control-Z when Complete. /HELP for Help.
/edit
[EOB]
*
```

We are now in EDT. Notice EDT's prompt: *. When you see this prompt, EDT is in line mode waiting for you to type a command. There are a great many useful commands, the most helpful of which is `HELP`. The commands I will cover are: `+`, `-`, `DELETE`, `INSERT`, `EXIT`, `QUIT`, `TYPE`, `INCLUDE`, `SUBSTITUTE`, and `RESEQUENCE` — I will cover only the simplest ways of using these commands. EDT is a very powerful editor that, at its most complex level, allows you to edit multiple files at once and to cut and paste between files (you will probably never need such complicated editing while on Delphi).

```
*include temp.txt
```

The entire file `TEMP.TXT` is now included in the edit buffer at the current cursor position — the beginning of the file since we haven't done anything else yet. If there is some text in the file, you can use the + and - commands to step through the text, much like Microware's `edit`. +5 advances five lines, - backs up one line. The ENTER key also acts like the + command, advancing a single line at a time. The current line is printed after these commands. You rarely want to include the entire message to which you are replying. If I want only lines one through five of a 20-line message, I could type:

```
*delete 6:20
```

to delete all other lines. Notice that a line range is specified using a colon, not a dash. Now I'm ready to add my text. First I want to quote Phil Scherer's text:

```
*insert 0.5
.lm 4 /annot=>
^Z
```

I inserted my text starting at Line 0.5. I exited insert mode by pressing CTRL-Z. EDT allows floating-point line numbers larger than 0, and the first line number is always one by default. Thus, `.lm 4 /annot=>` precedes the first line I included. Now I need to remove the quoting and reset the left margin:

```
*insert 6
.lm 0
```

I am still in insert mode and can now enter my reply. When I finish, I will press CTRL-Z to exit insert mode. If I want to examine what I've typed, I can enter:

```
*type 0:20
```

to list the first lines of my message, which may be more than 20 lines because of non-integer line numbers. If I'm satisfied with the message, I can exit EDT and send the message by entering `EXIT`. This drops me back into Delphi's editor, where I can press CTRL-Z or use the command `/EXIT` to get back to the `FORUM>` prompt. If, instead, I enter `QUIT` to quit EDT, I'll exit EDT without saving any of the changes I made but will still be dropped back into Delphi's editor.

If you get confused by the non-integral line numbers, you can enter `RESEQUENCE` to reorder the line numbers to integers starting at one. This is the simplest use of the resequence command. Type `HELP RESEQUENCE` to find more information.

Finally, if you need to change part of the text of a line, you can use the `SUBSTITUTE` command. If the current line is

```
12          machine w/ 15 MIPS (meaningless indlax of plumetting speed) and a
```

and I want to correct *indlax* to *index*, I would type:

```
*sub ;indlax;index;
1 substitution made
```

EDT reports it made one substitution. Notice I used the semicolon to begin and end the initial and final string. Any punctuation character will work. Most people use semicolons or slashes, but you must use the same character all three times.

You can also repeat a substitution on many lines; add the line range to the end of the command.

```
*sub ;recieve;receive; 1:99
```

This corrects the spelling of receive throughout a file (if the file's last line is smaller than 99). The `SUBSTITUTE` command, when given a line range, will replace the string more than once per line if it is found more than once in a line. Without a line range, only the first instance is replaced on the current line.

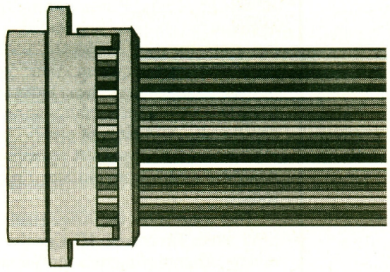
New Uploads

Jim Sutemeier (JSUTEMEIER) studied the abilities of four different file compression programs with OS-9/68000: `ar`, `ARC`, `LHArc`, and `Zoo`. If you are looking for the best compression program, his upload to the OS-9 SIG General Information database will help your search. **Phil Scherer** (PHILSHERER) contributed several issues of the OCN (OS-9 Community Network) newsletter. The OCN is a relatively new organization striving to tie together OS-9 users into a solid community.

If you use `mroff` to format text, you might be interested in **Joel Rees**' (REIISIKENKYU) upload, which explains how to enable the `-p` (page offset) option. **John Semler** (SEMLER) released a scientific calculator program that works with both OS-9/6809 and OS-9/68000. Astronomers among us will appreciate **Jim Martin**'s (WOAY) almanac, which calculates right ascension and declination of the Sun, Moon, and Mercury through Pluto as well as other astronomical information. **Robert Kemper** (BOBKEMPER) submitted `pcls`, which sends a formfeed to your printer.

In the Music & Sound database, **Mike Knudsen** (RAGTIMER) released a program that allows recording (digitizing) and playing stereo audio on the MM/1; he also uploaded a digitized sample. Joel Rees uploaded many files to the Programmers Den database, including BASIC09 and PASCAL09 programs that allow you to use include files with BASIC09 and PASCAL09. He also uploaded a partial list of bugs in the Microware C compiler used on the CoCo.

In the CoCo SIG CoCo 3 Graphics database, **Joe Sannucci** (SANNUCCI) uploaded a practical joke program (`TRICK`); try it! He also uploaded updates to **Chet Simpson**'s *Image Master*, a sprite creating program. **Jerry Brown** (JERRY79) released a horse handicapping program into the Utilities & Applications database. Joel Rees contributed a threaded dialect of FORTH. **Richard McNabb** (RICKMAC) released a number of programs, including one that numbers the lines of a file so you can print it and another one that helps convert assembly-language source files so they are legal with EDTASM. His Book Utility allows you to print on both sides of paper. **Robert Newhart** (BNEWHART) submitted a calculator program that includes interest rates and ham radio antennas in addition to other features. **Jerry Cambpell** (6147) uploaded a handful of *CoCoMAX* clipart files into the Classic Graphics database.



DATABASE REPORT

OS-9 SIG

General Information

68XXX MACHINES ADVERTISEMENT	
EDELMAR	Ed Gresick
G-WINDOWS ANN. FOR SYSTEM IV	
EDELMAR	Ed Gresick
STATS. ON 4 DIFFERENT ARCHIVERS	
JSUTEMEIER	Jim Sutemeier
FHL'S NEW QT 68030 ANNOUNCEMENT	
FHOGG	Frank Hogg
OCN NEWS LETTERS THRU JAN. 1992	
PHILSCHERER	Phil Scherer
FIRST ANNUAL LAST COCOFEST	
DAVEMYERS	Dave Myers

Applications (6809)

MROFF PRINT FORMATTER UPDATE: -P	
REIISIKENKYU	Joel Rees
SCALC: SCIENTIFIC CALCULATOR	
SEMLER	John Semler
GRAND MASTER CHESS 0.9	
MATHOMPSON	Matthew Thompson
PRINTFORM 2.1: TEXT FORMATTER	
WOAY	Jim Martin
ALMANAC	
SEMLER	John Semler

FF: FIND FILE
MEYE001 Homer Meyer
PCLS V1.5 PAGE EJECTOR
BOBKEMPER Robert Kemper

Telecom (6809)
MEDIT V1.9 PATCHES
AIRWOLF2 Aaron Yates
CRC LIST FOR RIBBS 2.02
SANDRIDER Charles West

Games & Graphics
TARGA-24 PIX TO GIF PIX
GRAPHICSPUB Bob Montowski
YET ANOTHER REVERSI (YAR)
REIISIKENKYU Joel Rees

Music & Sound
STEELDRUM STEREO SOUND SAMPLE
RAGTIMER Mike Knudsen
RECPLAY: RECORD/PLAY STEREO SND
RAGTIMER Mike Knudsen
MIXED ASSORTMENT OF UMUSE3 SCORE
MISHOO Mike Shook

Programmers Den
SORT ALGORITHMS FOR BASIC09
SANDRIDER Charles West
ITALIC/SCRIPT FONT FOR COCO
REIISIKENKYU Joel Rees
FILE INCLUSION PROCESSORS
REIISIKENKYU Joel Rees
MORE BUGS FOR MWC
REIISIKENKYU Joel Rees

OSK Applications
SEA ARC VRS. 5.21 FOR OSK
MIKEHAALAND Mike Haaland

OSK Telecom
TERMCAP/TERMSET FILES FOR TC-70
JSUTEMEIER Jim Sutemeier
GAURDIAN: FIX FOR MM/1 /TO PORT
RANDYKWILSON Randy Wilson

OSK System Modules
MM/1 MODULES UPDATE (REVISED)
MARKGRIFFITH Mark Griffith

Tutorials & Education
GETTING STARTED WITH MV
EARTHER Shawn Driscoll

Standards
OSK GRAPHICS / SOUND PROPOSAL
DONVAIL Don Vaillancourt

COCO SIG

General Information
CHIFEST.TXT
DAVEMYERS Dave Myers

CoCo 3 Graphics
NEW IMAGE MASTER VERSIONS
SANNUCCI Joe Sannucci
SAVE COMPRESSED HSCREENS
RICKMAC Richard McNabb
TRICK
SANNUCCI Joe Sannucci

Utilities & Applications
HORSE-PRO(DEMO)
JERRY79 Jerry Brown
BIF DIALECT OF FORTH V1.0
REIISIKENKYU Joel Rees
PERIODICAL TABLE OF THE ELEMENTS
DRILLMASTER Johnny Williams
ALTERNATE 32 COLUMN SCREENS
RICKMAC Richard McNabb
ASCII LINE NUMBERER
RICKMAC Richard McNabb
SPLIT MULTIPLE FCB'S
RICKMAC Richard McNabb
FILE EXTENSION CHANGER
RICKMAC Richard McNabb
32-COLUMN LISTER
RICKMAC Richard McNabb
BACKUP CHECKER
RICKMAC Richard McNabb
BOOK UTILITY
RICKMAC Richard McNabb
BASE CONVERSION CHART
RICKMAC Richard McNabb
CALC.BAS
BNEWHART Robert Newhart
LOTTOPRO/ARC
JERRY79 Jerry Brown

Hardware Hacking
IR REMOTE RECEIVER
BHAWKINS Bob Hawkins

Games
HORSERACE.BAS
BNEWHART Robert Newhart
OREGON.BAS
BNEWHART Robert Newhart
TALKING STOCK MARKET
SANNUCCI Joe Sannucci

Classic Graphics
KIDS.MAX D8CE
6147 Jerry Campbell

Corrections

***Ultralace:* Update and Upgrade (May 1992, Page 20):** We got a little overzealous when editing the article and (unfortunately) changed the case of a case-sensitive word. The text in Column 3 on Page 20 indicates you should use *Private Times* as the example title. If you do, you'll find the subsequent text won't make any sense. The title of the example publication must be *PRIVATE TIMES*. We apologize for any confusion this may have caused.

***Window Master Desk Accessory Pak* (Review, June 1992, Page 13):** The telephone number for Cer-Comp LTD. is incorrectly listed at the end of the review. The correct number is (702) 452-0632.

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Feature Program

Fast Backups with 128K

Early on, CoCo users saw 4K just wouldn't be enough for what they wanted to do. Then technology evolved, the market grew, and now many of us have CoCo 3's that can be taken to 512K and beyond. And there are many programs designed for CoCos with this much memory. But what about those whose CoCo 3's are still at 128K (after all, the upgrade is still pretty costly)?

Sure, the manual says the CoCo 3 comes with 128K. But as most who have looked have found out, you can still use only a fourth of this for BASIC unless you use a third-party package that opens up the extra memory. I believe we should use the extra memory in the 128K machine to make life a little easier. So I wrote *Backup*, a single-drive disk-backup program.

Backup is very different than Disk BASIC's BACKUP command simply because it is designed to use all of the 128K. The result is that you'll have to swap disks only three times (for 35 tracks) as opposed to the seven or more swaps required by Disk BASIC's BACKUP. In addition, *Backup* can be used to back up 35-, 40- and 80-track disks, and you get to watch as the tracks and sectors are copied. Best of all, *Backup* is written in machine language for pure speed.

To create the machine-language version of *Backup*, first enter the BASIC program listing presented here and save it to disk. While the program does check to make sure the data values you enter (there are a lot of them) are correct, you'll save time and trouble if you are careful when entering the data. Once you have a good working copy, run the program and it automatically creates the machine-language program and saves it to disk.

To use *Backup*, first make sure your CoCo 3 is set to a 32-column screen width (the program uses the 40- and 80-column screen memory for storage.) If you forget, *Backup* will remind you. Then enter

```
LOADM"BACKUP":EXEC
```

to execute the program. *Backup* defaults to 35-track format; to change the number of tracks you want copied, replace EXEC above with

```
EXEC 3584,xx
```

where *xx* is the number of tracks. Just remember you'll have to make more swaps with the larger number of tracks.

Backup has been of great value to me, and I'm sure you'll find it to be of great help to you, too. This program actually makes backing up a disk fun to watch! (Hard to believe, isn't it?) Perhaps the only drawback is that now you have no more excuses for not making those backups you should be making.

Joel Mathew Hegberg has been programming for nine years and enjoys writing software for the Color Computer and MM/1. Some of his commercial creations are available through Sub-Etha Software. Joel may be contacted at 936 N. 12th Street, DeKalb, IL 60115-2516, (815) 748-6638. Please include an SASE when requesting a reply.

CoCo 3

The Listing: BACKUP

```
1 '128K COCO 3 BACKUP
2 'BY JOEL MATHEW HEGBERG
3 'COPYRIGHT (C) 1992
4 'BY FALSOFT, INC.
5 'RAINBOW MAGAZINE
120 'CREATED FOR "THE RAINBOW"
130 'ON APRIL 20, 1989 BY
140 'JOEL MATHEW HEGBERG
150 '936 NORTH TWELFTH STREET
160 'DE KALB, ILLINOIS  60115
170 '
180 PMODE0,1:PCLEAR4:PMODE4,1:PC
LS
190 CLS:PRINT"PLEASE WAIT..."
200 LC=3584:LT=0:TL=0:RN=340
210 READ A$:IFA$="**"THEN250
220 IFLEN(A$)=3THEN320
230 VL=VAL("&H"+A$):POKELC,VL:LC
=LC+1:LT=LT+VL:TL=TL+VL
240 GOTO210
250 READ TT:IFTT<>TL THEN PRINT"
ERROR IN DATA STATEMENTS.":PRINT
"***I CAN'T FIND THE ERROR!***":
END
260 PRINT"SAVING FILE..."
270 SAVEM"BACKUP.BIN",3584,4525,
3584
280 PRINT"*JOB COMPLETE*":PRINT
290 PRINT"TO RUN, TYPE:"
300 PRINT"LOADM ";CHR$(34);"BACK
UP";CHR$(34):PRINT"EXEC":PRINT
310 END
320 VL=VAL("&H"+A$):IFLT<>VL THE
N PRINT"DATA ERROR IN LINE #";RN
:END
330 LT=0:RN=RN+10:GOTO210
340 DATA 16,3,5F,23,FF,FF,FF,FF,
FF,FF,FF,FF,FF,FF,FF,FF,FF,EB
D
350 DATA 49,4E,53,45,52,54,20,53
,4F,55,52,43,45,20,44,49,53,4B,5
11
360 DATA 45,54,54,45,20,26,20,50
,52,45,53,53,D,5B,45,4E,54,45,4B
9
370 DATA 52,5D,2E,D,0,49,4E,53,4
5,52,54,20,44,45,53,54,49,4E,41,
4E7
380 DATA 54,49,4F,4E,20,44,49,53
,4B,45,54,54,45,20,26,D,50,52,4A
C
390 DATA 45,53,53,20,5B,45,4E,54
,45,52,5D,2E,D,0,42,41,44,20,53,
4B6
400 DATA 4F,55,52,43,45,20,44,49
,53,4B,45,54,54,45,2E,D,0,42,41,
4B9
410 DATA 44,20,44,45,53,54,49,4E
,41,54,49,4F,4E,20,44,49,53,4B,4
F1
420 DATA 45,54,54,45,2E,D,0,54,5
2,41,43,4B,3A,0,53,45,43,54,4F,4
9A
430 DATA 52,3A,0,54,48,49,53,20,
50,52,4F,47,52,41,4D,20,43,41,4A
0
440 DATA 4E,4E,4F,54,20,42,45,20
,45,58,45,43,55,54,45,44,D,4F,4B
9
450 DATA 4E,20,41,20,34,30,2F,38
,30,20,43,4F,4C,55,4D,4E,20,53,4
2B
460 DATA 43,52,45,45,4E,2E,D,0,4
E,55,4D,42,45,52,20,4F,46,20,446
470 DATA 54,52,41,43,4B,53,3A,0,
2A,2A,42,52,45,41,4B,2A,2A,D,41C
480 DATA 0,A6,80,10,27,0,7,AD,9F
,A0,2,16,FF,F3,39,AD,9F,A0,0,77F
490 DATA 7F,FF,40,CC,0,0,DD,8D,B
D,A9,56,86,96,97,8C,CC,0,4,DD,99
C
500 DATA 8D,34,30,BD,A9,56,35,30
,AD,9F,A0,0,81,3,10,27,2,63,81,6
9F
510 DATA D,10,26,FF,F0,39,CC,0,0
,FD,E,4,FD,E,6,FD,E,8,96,E7,10,7
F7
520 DATA 26,1,9F,BD,A9,28,7F,FF,
D6,7F,FF,D8,17,2,20,CC,4,0,DD,8E
4
530 DATA 88,8E,E,12,17,FF,99,17,
FF,A4,7F,E,8,17,1,8B,7C,E,5,B6,7
1C
540 DATA E,5,81,12,10,23,0,12,86
,1,B7,E,5,7C,E,4,B6,E,4,B1,E,451
550 DATA 3,10,24,0,38,FC,E,4,DD,
EC,86,2,97,EA,10,9F,EE,17,0,CE,7
D1
560 DATA BD,D7,5F,96,F0,10,26,0,
A9,1E,2,C3,1,0,1E,2,7C,E,A,B6,6A
6
570 DATA E,A,B1,E,9,10,25,FF,B6,
B6,E,8,81,4,10,24,0,3,16,FF,A7,6
0E
580 DATA CC,4,0,DD,88,8E,E,3B,17
,FF,2F,17,FF,3A,7F,E,8,17,1,21,6
6F
590 DATA 7C,E,7,B6,E,7,81,12,10,
23,0,12,86,1,B7,E,7,7C,E,6,B6,4C
D
600 DATA E,6,B1,E,3,10,24,0,38,F
C,E,6,DD,EC,86,3,97,EA,10,9F,6D4
610 DATA EE,17,0,A9,BD,D7,5F,96,
F0,10,26,0,4D,1E,2,C3,1,0,1E,6AC
620 DATA 2,7C,E,A,B6,E,A,B1,E,9,
10,25,FF,B6,B6,E,8,81,4,10,24,59
B
630 DATA FF,2F,16,FF,A7,CC,5,BE,
DD,88,86,78,B7,FF,A0,86,79,B7,AE
8
640 DATA FF,A1,86,7A,FD,FF,A2,86
,7B,B7,FF,A3,86,7C,B7,FF,A4,39,C
2D
650 DATA CC,5,A0,DD,88,8E,E,69,1
7,FE,A6,16,FF,D8,CC,5,A0,DD,88,A
59
660 DATA 8E,E,7F,17,FE,98,16,FF,
CA,34,76,CC,4,C0,DD,88,8E,E,9A,9
7C
670 DATA 17,FE,88,F6,E,4,4F,BD,B
4,F4,BD,BD,D9,30,1F,BD,B9,9C,A0D
680 DATA 86,20,AD,9F,A0,2,CC,4,E
0,DD,88,8E,E,A1,17,FE,68,F6,E,96
7
690 DATA 5,4F,BD,B4,F4,BD,BD,D9,
30,1F,BD,B9,9C,86,20,AD,9F,A0,9F
F
700 DATA 2,35,76,39,34,76,CC,4,D
0,DD,88,8E,E,9A,17,FE,43,F6,E,82
7
710 DATA 6,4F,BD,B4,F4,BD,BD,D9,
30,1F,BD,B9,9C,BD,B9,58,CC,4,A0C
720 DATA F0,DD,88,8E,E,A1,17,FE,
26,F6,E,7,4F,BD,B4,F4,BD,BD,D9,A
DF
730 DATA 30,1F,BD,B9,9C,BD,B9,58
,35,76,39,8E,5,A0,9F,88,8E,E,809
740 DATA A9,17,FE,6,39,10,8E,20,
0,7F,E,A,B6,E,8,10,27,0,1F,81,4F
5
750 DATA 1,10,27,0,2C,81,2,10,27
,0,39,7C,E,8,86,40,B7,E,9,86,403
760 DATA 76,B7,FF,A1,86,77,B7,FF
,A2,39,7C,E,8,86,40,B7,E,9,86,90
7
770 DATA 70,B7,FF,A1,86,71,B7,FF
,A2,39,7C,E,8,86,40,B7,E,9,86,8F
B
780 DATA 72,B7,FF,A1,86,73,B7,FF
,A2,39,7C,E,8,86,40,B7,E,9,86,8F
F
790 DATA 74,B7,FF,A1,86,75,B7,FF
,A2,39,9D,A5,81,2C,10,27,0,8,885
800 DATA 86,23,B7,E,3,16,FD,CD,9
D,9F,BD,B7,B,F7,E,3,16,FD,C2,8E9
810 DATA CC,4,60,DD,88,8E,E,E4,1
7,FD,79,F6,E,3,4F,BD,B4,F4,BD,A1
A
820 DATA BD,D9,30,1F,BD,B9,9C,BD
,B9,58,39,35,6,CC,5,A0,DD,88,90F
830 DATA 8E,E,F6,17,FD,59,16,FE,
8B,0,0,0,**, 93262
```

Product Review

War Monger: The CoCo Battlefield

War Monger is an exciting, disk-based CoCo 3 game that allows you to create two armies and have them fight against each other. The computer can control one, both or neither army, so you can play against friends if you like. The armies are placed on a realistic battlefield map. You can design your own terrain or use one of several predesigned terrains supplied on the disk. Each of the armies is made up of one to 60 units; each of these units has its own unique characteristics such as strength, firepower, range and mobility.

War Monger is menu-driven and provides various options that you use to set up the game. You can define the various attributes for the armies, name weapons, and select color palettes as well as various terrain graphics. The terrain graphics are needed in order to create the map of the battlefield.

These various editing functions allow the user to design fighting units with all sorts of military hardware including ships, tanks, artillery, submarines, and planes. Even a fleet of spaceships can be selected for more futuristic battles. An option for men with or without armor and horses lets you step back in time to experience ancient warfare. An append function is provided which allows you to combine features from different games. You can carry this to the extreme, if you like, and have King Arthur's knights fighting men in space ships armed with laser cannons.

Six sample wars are included on the disk I mentioned earlier. One of these, *Flags*, is a game that kids might enjoy playing: The weapons are water balloons. Another game, *Pacific*, is set during the period of World War II and pits the Japanese against the allies.

Understanding the various features of *War Monger* requires reading of the 31-page instruction booklet. This is a complicated game with thousands of variations. Although the game is fun to play and contains excellent graphics and colors, you must understand what you are doing. Simply put, *War Monger* is not an arcade shoot-em-up but a real challenge of your warring skill.

War Monger requires a CoCo 3 and either an RGB (recommended) or composite monitor, and a disk drive. *(Sundog Systems, P.O. Box 766, Manassas, VA 22111, 703-330-8989; $29.95 plus $2.50 S/H).*

— Robert Gray

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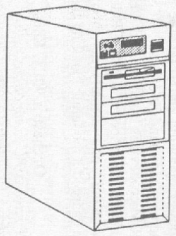

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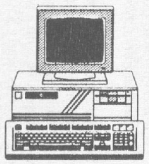

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Repeats *continued from Page 1*

peared in Dale Puckett's "KISSable OS-9" several years ago, functioned quite well but contained the seeds of disaster. Not too long ago I decided to delete all the files in a directory, so I entered

```
d ! rep del $
```

All files in the directory were dutifully deleted. The only problem was that I had previously set my current data directory to the wrong directory. To prevent this from happening again, I rewrote *Rep* so it displays each command being executed — now you're not blind to what's happening. The following example shows how `Rep`'s output might look:

```
OS9: d ! rep del $
del file1
del file2
. . .
del lastfile
```

For even greater protection, *Rep* accepts an `-ok` option. If you enter `-ok` after `rep` (and just before the command name), the program pauses and requests your permission to execute the command for each parameter it receives. It looks something like this:

```
OS9: d ! rep -ok del $
del file1? (y/n): y
del file2? (y/n): n
. . .
del lastfile? (y/n): y
```

To get *Rep* up and running on your system, enter and assemble the source code shown in Listing 1. If you do not have an assembler, use `MakeRep`, the `BASIC09` program shown in Listing 2. `MakeRep` generates the executable `rep` program and saves it in the `CMDS` directory. (OS-9 Level I users need to change all references to `/dd` to the drive where their `CMDS` directories are located. This is usually `/d0`.)

Rep can be a real finger saver when you have the need to repeatedly execute a command. I hope you'll find it useful.

Stephen Goldberg is a dentist and the author of the Utilipak *series of OS-9 utilities. He can be contacted at 695 Plainview Road, Bethpage, NY 11714. Please include an SASE when requesting a reply.*

CoCo 3

Listing 1: `Rep.asm`

```
*************************************************
*
* REP  -  COPYRIGHT (c) 1989 by S.B.GOLDBERG
*
* Repetative execution of OS-9 commands taking
* parameter variables from the standard input.
*
        ifp1
        use   /dd/defs/os9defs
        endc
*
        mod   len,name,prgrm+objct,reent+1,entry,dsiz
*
params  rmb   200             command parameters
keypath rmb   1               keyboard input path
cmdname rmb   2               command name pointer
pramaddr rmb  2               address of parameters
headaddr rmb  2               module header address
buffer  rmb   100             input buffer
        rmb   200             stack
        rmb   200             Rep parameters
dsiz    equ   .
*
name    fcs   /Rep/
        fcb   3               edition number
        fcc   /(c)1989 S.B.Goldberg/
*
cant    fcc   /**** Can't find command: /
missing fcb   $07
cantlen equ   *-cant
        fcc   /**** Missing $/
cr      fcb   $0d
term    fcs   "/term"
*******************************
* ERROR MESSAGES
*******************************
nodollar leax <missing,pcr    missing "$" message
        clrb                  clear error flag
        bra   errorout        message to screen and quit
cantfind leax <cant,pcr       can't find command message
        ldy   #cantlen        message length
        lbsr  write           message to screen
        ldx   cmdname         command name pointer
nameloop lda  ,x+             command name character
        cmpa  #$20            end of name?
        bhi   nameloop        no, look some more
        lda   #$0d            yes, carriage return
        sta   ,-x             to end of name
        ldx   cmdname         command name pointer
errorout ldy  #100            maximum length
        lbsr  write           to screen
quit    lbra  error           quit Rep
*******************************
* LINK OR LOAD COMMAND MODULE
*******************************
entry   pshs  x               save parameter pointer
        clr   keypath         clear keyboard input path
dolarchk lda  ,x+             parameter character
        cmpa  #$0d            end of parameters?
        beq   nodollar        yes, message and quit
        cmpa  #'$             dollar sign?
        bne   dolarchk        no, look some more
        puls  x               parameter pointer
        lda   ,x+             first parameter character
        cmpa  #'-             option?
        bne   link            no, get command
        ldd   ,x++            next parameter characters
        ora   #$20            make both lower case
        orb   #$20
        cmpd  #$6f6b          is it ok?
        beq   openpath        yes, continue
        leax  -3,x            no, reset parameter pointer
openpath pshs  x              save parameter pointer
        leax  <term,pcr       terminal device name
        lda   #read.          read mode
        os9   i$open          open path from keyboard
        bcs   quit            exit with error
        sta   keypath         save keyboard path number
        puls  x               retrieve parameter pointer
findcmd lda   ,x+             parameter character
        cmpa  #$20            command name?
        beq   findcmd         no, look again
link    leax  -1,x            point to command name
        stx   cmdname         save command name address
        clra                  any type or language
        pshs  u               save data pointer
        os9   f$link          link to module
        bcc   saveaddr        no error, continue
        cmpb  #221            can't find in memory?
        bne   quit            quit with other error
        os9   f$load          else try to load module
        bcs   cantfind        prompt and quit on error
saveaddr stu  headaddr        save module header address
        stx   pramaddr        save command parameter address
        puls  u               retrieve data pointer
*******************************
* CREATE COMMAND PARAMETERS
*******************************
getvar  clra                  standard input path
        ldy   #100            maximum variable length
        leax  buffer,u        variable buffer
        os9   i$readln        read variable
        bcs   quit            branch on error
        cmpy  #1              <ENTER>?
        lbeq  noerr           yes, terminate Rep
        tfr   u,x             command parameter buffer
        ldy   pramaddr        command line parameters
moveloop lda  ,y+             get parameter character
        cmpa  #'$             dollar sign?
        beq   movevar         yes, move variable to buffer
        sta   ,x+             no, character to parameter buffer
        cmpa  #$0d            end of parameters?
        beq   display         yes, display and execute command
        bra   moveloop        no, move next character
*
movevar pshs  y               save parameter pointer
        leay  buffer,u        variable buffer
varloop ldd   ,y+             get variable characters
        sta   ,x+             move one to parameter buffer
        cmpb  #$0d            end of variable?
        bne   varloop         no, move another character
        puls  y               retrieve parameter pointer
        bra   moveloop        back to parameter move
*******************************
* DISPLAY AND EXECUTE COMMAND
*******************************
errbell bsr   ringbell        sound terminal bell
display ldx   cmdname         command name pointer
cmdloop bsr   writeone        character to screen
        lda   ,x+             check character
        cmpa  #$20            end of command name?
        bhi   cmdloop         no, print next character
        tfr   u,x             command parameters
pramloop bsr  write           parameter character to screen
        ldd   ,x+             parameter characters
        cmpb  #$0d            end of parameters?
        bne   pramloop        no, display next character
        tst   keypath         want pause and prompt?
        bne   doprompt        yes, do it
        leax  cr,pcr          no, carriage return
        bsr   write           go to next line
        bra   fork            execute command
*
ringbell leax missing,pcr     error bell
writeone ldy  #1              one character
write   lda   #1              standard output path
        os9   i$writln        write to screen
        bcs   passerr         exit with error
        rts                   return
*
doprompt leax <ok,pcr         permission prompt
        ldy   #oklen          length of prompt
        bsr   write           prompt to screen
        lda   keypath         keyboard input path
        leax  buffer,u        key input buffer
        ldy   #1              one character
        os9   i$read          get answer to prompt
passerr bcs   unlink          exit with error
        leax  cr,pcr          carriage return
        bsr   write           go to next line
        lda   buffer          keyboard input character
        ora   #$20            make lower case
        cmpa  #'n             is it "n"?
        beq   newvar          yes, just get next variable
        cmpa  #'y             is it "y"?
        bne   errbell         no, error bell and reprompt
fork    ldd   #$0001          type/lang. default data size
        ldx   cmdname         command name pointer
        ldy   #200            maximum parameter size
        os9   f$fork          execute the command
        bcs   unlink          exit with error
        os9   f$wait          wait for command to finish
        tstb                  command pass an error?
        beq   newvar          no, get next variable input
        bsr   ringbell        yes, sound terminal bell
        cmpb  #2              <BREAK>?
        beq   unlink          yes, quit
        os9   f$perr          print error number
newvar  lbra  getvar          get next variable
*******************************
* CHECK ERROR AND EXIT REP
*******************************
error   cmpb  #e$eof          end of the input file?
        bne   unlink          no,  exit with error
noerr   clrb                  yes, clear error flag
unlink  ldu   headaddr        get module header address
        os9   f$unlink        unlink command module
out     os9   f$exit          quit Rep
```

```
*
ok      fcc   "? (y/n): "
oklen   equ   *-ok
*
        emod
len     equ   *
        end
```

Listing 2: MakeRep.b09

```
PROCEDURE MakeRep
 0000       (* Generates the binary module rep *)
 0025       (* Level I - change all /dd to /d0 *)
 004A       DIM path,byt:BYTE
 0055       DIM count:INTEGER
 005C       PRINT "Creating rep . . .";
 0073       CREATE #path,"/dd/cmds/rep":WRITE
 008A       FOR count=1 TO 416
 009B         READ byt
 00A0         PUT #path,byt
 00AA       NEXT count
 00B5       CLOSE #path
 00BB       PRINT
 00BD       SHELL "attr /dd/cmds/rep e pe"
 00D7       END
 00D9       DATA 135,205,1,160,0,13,17,129,137,0,123,2,195,82,101,240
 010D       DATA 3,40,99,41,49,57,56,57,32,83,46,66,46,71,111,108,100
 0144       DATA 98,101,114,103,42,42,42,42,32,67,97,110,39,116,32,102
 0178       DATA 105,110,100,32,99,111,109,109,97,110,100,58,32,7,42
 01A9       DATA 42,42,42,32,77,105,115,115,105,110,103,32,36,13,47
 01DA       DATA 116,101,114,237,48,140,232,95,32,24,48,140,201,16,142
 020B       DATA 0,26,23,0,210,158,201,166,128,129,32,34,250,134,13
 023C       DATA 167,130,158,201,16,142,0,100,23,0,189,22,1,12,52,16
 0270       DATA 15,200,166,128,129,13,39,206,129,36,38,246,53,16,166
 02A1       DATA 128,129,45,38,36,236,129,138,32,202,32,16,131,111,107
 02D2       DATA 39,2,48,29,52,16,48,140,170,134,1,16,63,132,37,205
 0306       DATA 151,200,53,16,166,128,129,32,39,250,48,31,159,201,79
 0337       DATA 52,64,16,63,0,36,9,193,221,38,179,16,63,1,37,143,223
 036E       DATA 205,159,203,53,64,79,16,142,0,100,48,201,0,207,16,63
 03A2       DATA 139,37,154,16,140,0,1,16,39,0,165,31,49,16,158,203
 03D6       DATA 166,160,129,36,39,8,167,128,129,13,39,22,32,242,52
 0407       DATA 32,49,201,0,207,236,160,167,128,193,13,38,248,53,32
 0438       DATA 32,224,141,32,158,201,141,32,166,128,129,32,34,248
 0466       DATA 31,49,141,26,236,128,193,13,38,248,13,200,38,24,48
 0497       DATA 141,255,36,141,10,32,58,48,141,255,13,16,142,0,1,134
 04CB       DATA 1,16,63,140,37,23,57,48,140,84,16,142,0,9,141,239,150
 0502       DATA 200,48,201,0,207,16,142,0,1,16,63,137,37,55,48,141
 0536       DATA 254,244,141,218,150,207,138,32,129,110,39,33,129,121
 0564       DATA 38,164,204,0,1,158,201,16,142,0,200,16,63,3,37,23,16
 059B       DATA 63,4,93,39,9,141,176,193,2,39,11,16,63,15,22,255,73
 05D2       DATA 193,211,38,1,95,222,205,16,63,2,16,63,6,63,32,40,121
 0609       DATA 47,110,41,58,32,231,75,212
```


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Feature Program

Open the Drawer On Inventory

The term *inventory* often brings to mind images of stock clerks running from shelf to shelf, perhaps with those fancy calculators strapped to their legs, counting every product in sight. But not all inventories are so complex (nor so simple). For small-business and personal use (valuable items in the home, collectibles, etc.), such a major production is out of place. This is one of the reasons I wrote the *Electronic File Cabinet* (*EFC*).

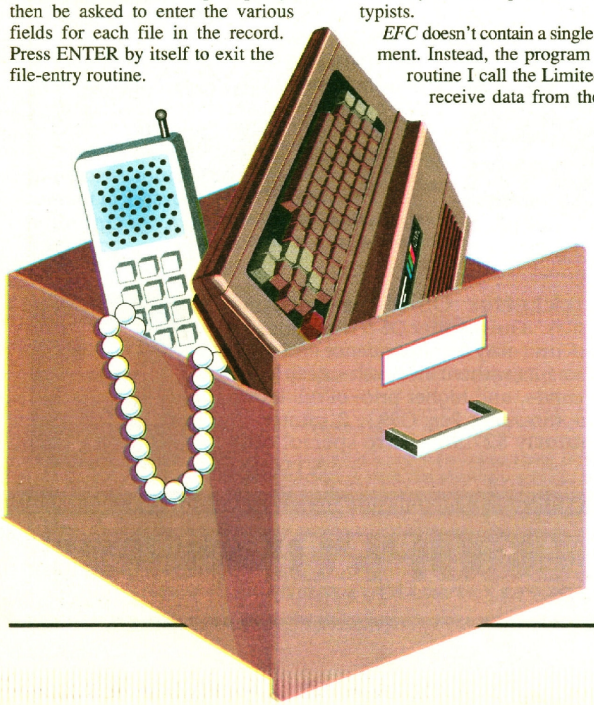
```
6030 OPEN "I",#-1,N$
6050 IF EOF(-1) THEN 6080
6060 IF Y<4 THEN INPUT#-1,A$(X,Y
) ELSE INPUT#-1,A(X,Y)
7630 OPEN "O",#-1,N$
7650 IF Y<4 THEN PRINT#-1,A$(F,Y
) ELSE PRINT#-1,A(F,Y)
```

Figure 1: Cassette Modifications

EFC works on any CoCo with at least 16K and Extended BASIC. The program supports a disk drive or cassette (after a few minor modifications, described below), and use of a printer is optional.

Before using *EFC*, it is important that you understand a few terms and how they relate to one another. In *EFC*'s parlance, a *record* is equivalent to a drawer in a file cabinet, and a *file* is the same as a folder in that drawer. (These are different definitions than those used by some other data-management systems.) The description, serial number, model number, etc. are the items (called *fields*) that go in the folder. Given this approach, a disk is viewed as the whole cabinet, which holds many drawers (records), each with a unique Disk BASIC filename.

When you run *EFC*, you'll see a prompt asking if you want to view/update an old record or create a new one. An "old" record is one that is already saved on disk. If you are running *EFC* for the first time, you'll have to create a new record, so press N, then enter an eight-character (max) legal filename for the record when prompted. You'll then be asked to enter the various fields for each file in the record. Press ENTER by itself to exit the file-entry routine.



After an old record has been loaded from disk (or tape) or a new one entered from the keyboard, it can be viewed, updated or printed. A menu of options appears on the bottom half of the screen. You can Edit, Delete or Add a file; Print, Save or Load a complete record; or Exit the program.

You can scroll through the files in memory using the up and down arrow: the up arrow key takes you to the previous file, and the down arrow moves you to the next file in the record.

To enter the Edit mode, press E. An arrow appears on the top half of the screen, allowing you to select the field you want to edit. When the arrow is pointing to the appropriate field, press ENTER and enter the new information. To exit the Edit mode, press the space bar.

To add a file to the end of the record, press A, or to delete the file currently displayed, press D. To print all the files in the record, press P.

Modifications

As written, *EFC* saves and loads data using sequential-access disk files. To convert the program for use with a cassette-based system, make the modifications outlined in Figure 1.

Shop Talk

Electronic File Cabinet is a basic inventory program — most RAINBOW readers have seen them before. What really sets *EFC* apart from most other inventory programs are its methods of operation and upside-down structure.

The most commonly used approach to getting input into a BASIC program is with the INPUT command. INPUT waits for the user to type a string of characters and press ENTER. But if the user enters data that doesn't meet certain standards, the computer forces him to try again. For example, if a user enters a name of fifteen characters at a program prompt that expects a string of only ten characters, he would have to retype the entry — a real pain for hunt-and-peck typists.

EFC doesn't contain a single INPUT statement. Instead, the program uses a subroutine I call the Limited Inputer to receive data from the keyboard. This subroutine uses the INKEY$ command to scan the keyboard. When a key is pressed, its "value" is added to the total of characters already pressed. If the left (back) arrow is pressed, the last key pressed is subtracted. If you enter more characters than allowed for, the program simply ignores you and waits for you to press ENTER. *EFC* uses this subroutine for all its input. To see what function each variable performs, refer to the variable dictionary in Figure 2.

Data Variables

N$	Record name
A$(1,1)	Description of File #1
A$(1,2)	Serial No. of File #1
A$(1,3)	Model No. of File #1
A$(1,4)	Amount owned of File #1
A$(1,5)	Value of File #1
A$(2,1)	Description of File #2
etc.	

Limited Inputer Variables

C, B	Location of input
T$	Total input
W$	Letter printed on sreen
I$	INKEY$ variable
A	Print location of prompt
Z	Maximum length of input

Edit-Routine Variables

L	Print location
P	Keeps track of location and of what to edit
P$	Arrow
IN$	INKEY$ variable

Figure 2: Variable Dictionary

To use this subroutine in your own program, print the input prompt at a specified location using a PRINT@ command. Then assign that print location to Variable A, and the maximum input length to Variable Z. Finally, have the program jump to the Limited Inputer subroutine. For example,

```
PRINT@20,''WHAT IS YOUR NAME?'':A=
17:Z=15:GOSUB 1000:NAME$=T$,
```

first prints the prompt WHAT IS YOUR NAME? at Screen Location 20. After assigning variables A and Z, control is transferred to Line 1000 (the location of the subroutine). The subroutine moves the print location 15 spaces to the right (Line 1030) and prints 15 periods (Line 1040) designating how much room the user has for input. After ENTER is pressed, the program returns to the point directly after the GOSUB command, where it assigns the variable NAME$ to whatever the user entered.

As far as program structure is concerned, *EFC* is "upside down." That is, the beginning of the program is at the bottom, and the most-used subroutines are at the top. This speeds up program operation since the computer starts searching for a subroutine at the top and works down. Putting the less-frequently used program parts at the bottom requires the computer to do far less searching.

———----

Daniel Doner wrote EFC *as a junior in high school — he is now a graduate student in mechanical engineering at Colorado State and is studying artificial intelligence. He is married and enjoys reading and flying. He may be contacted at 818 Foxtail Street, Fort Collins, CO 80524, (303) 490-1613. Please include an SASE when requesting a reply.*

16K Disk

The Listing: ECABINET

```
1 'ELECTRONIC CABINET
2 'BY DANIEL D. DONER
3 'COPYRIGHT (C) 1992
4 'BY FALSOFT, INC.
5 'RAINBOW MAGAZINE
10 GOTO 10440
1000 '
1010 '  LIMITED INPUTER
1020 '
1030 C=15+A:T$="":B=C
1040 PRINT@C,STRING$(Z,".")
1050 PRINT@B,"";
1060 I$=INKEY$:IF I$="" THEN 106
0
1065 IF ASC(I$)=8 AND B>C THEN P
RINT@B-1,".";:B=B-1:T$=LEFT$(T$,
LEN(T$)-1):GOTO 1050 ELSE IF ASC
(I$)=21 THEN B=C:T$="":GOTO 1040
 ELSE IF ASC(I$)=13 THEN RETURN
1070 IF B=C+Z THEN 1060
1080 W$="":T$=T$+I$
1090 W$=W$+I$:PRINT@B,W$;:IF B<C
+Z THEN B=B+1
1100 GOTO 1050
2000 '
2010 '   PRINT DATA
2020 '
2030 Y=1
2040 CLS
2050 PRINT@5,"RECORD NAME: ";N$:
PRINT@28,"#";I;
2060 PRINT@32, STRING$(32,131);
2070 PRINT@67,"DESCRIPTION: ";:P
RINT@67+13,A$(I,Y):Y=Y+1
2080 PRINT@99,"SERIAL NO.: ";:PR
INT@99+13,A$(I,Y):Y=Y+1
2090 PRINT@131,"MODEL: ";:PRINT@
131+13,A$(I,Y):Y=Y+1
2100 PRINT@163,"NO. OWNED: ";:PR
INT@163+12,A(I,Y):Y=Y+1
2110 PRINT@195,"VAL OF EACH: ";:
PRINT@195+12,A(I,Y):Y=Y+1
2120 PRINT@224,STRING$(32,131);
2130 PRINT@260,"TOTAL VALUE: ";:
PRINT USING"$$#####.##";A(I,4)*
A(I,5)
2140 PRINT@323,"<E> - EDIT   <S
> - SAVE"
2150 PRINT@355,"<L> - LOAD   <D
> - DELETE"
2160 PRINT@387,"<A> - ADD    <X
> - EXIT"
2165 PRINT@419,"<P> - PRINT"
2170 '
2180 '       FILE SELECT
2190 '
2200 IN$=INKEY$:IF IN$="" THEN 2
200 ELSE IN=ASC(IN$)
2210 IF IN=94 AND I>=2 THEN I=I-
1:GOTO 2000 ELSE IF IN=10 AND I<
X THEN I=I+1:GOTO 2000 ELSE IF I
N=69 THEN GOSUB 4000:GOTO 2000 E
LSE IF IN=65 THEN GOSUB 10250:GO
TO 2000 ELSE IF IN=88 THEN GOSUB
 10140:GOTO 2000
2220 IF IN=83 THEN GOSUB 7000:GO
TO 2000 ELSE IF IN=76 THEN GOSUB
 6000 ELSE IF IN=68 THEN GOSUB 1
0000:GOTO 2000 ELSE IF IN=80 THE
N GOSUB 8000:GOTO 2000 ELSE2200
4000 '
4010 '
4020 '  EDIT ROUTINE
4030 '
4040 L=64:P=1
4050 PRINT@L,P$;
4054 PRINT@429,"EDIT :";
4055 PRINT@450,"USE UP-DOWN ARRO
WS TO SELECT"
4056 PRINT@489,"<SPACE> TO EXIT"
```

```
;
4060 IN$=INKEY$:IF IN$="" THEN 4
060 ELSE IN=ASC(IN$)
4070 IF IN=94 AND P>1 THEN L=L-3
2:P=P-1 ELSE IF IN=10 AND P<=4 T
HEN L=L+32:P=P+1 ELSE IF IN=32 T
HEN RETURN ELSE IF IN=13 THEN 41
10 ELSE 4060
4080 IF L>64 THEN PRINT@L-32,"
";
4090 IF L<192 THEN PRINT@L+32,"
 ";
4100 GOTO 4050
4110 IF P=1 THEN A=65 ELSE IF P=
2 THEN A=97 ELSE IF P=3 THEN A=1
29 ELSE IF P=4 THEN A=161 ELSE I
F P=5 THEN A=193
4120 IF P<4 THEN Z=15 ELSE IF P>
4 THEN Z=6 ELSE Z=4
4130 GOSUB 1000
4140 A$(I,P)=T$:IF P=1 AND A$(I,
P)="" THEN 4120 ELSE IF P>3 THEN
 A(I,P)=VAL(A$(I,P)):IF P=4 AND
A(I,P)<1 OR P=5 AND A(I,P)<.01 T
HEN 4120 ELSE A(I,6)=A(I,5)*A(I,
4)
4150 RETURN
5910 '
5920 ' LOAD DATA FROM DISK
5930 '
6000 CLS
6010 PRINT@96,"RECORD NAME TO LO
AD:";:Z=8:A=102:GOSUB 1000
6020 N$=T$:IF VAL(LEFT$(N$,1))>0
 OR N$="" THEN 6010
6030 OPEN "I",#1,N$
6040 FOR X=1 TO 51:FOR Y=1 TO 5
6050 IF EOF(1) THEN 6080
6060 IF Y<4 THEN INPUT#1,A$(X,Y)
 ELSE INPUT#1,A(X,Y)
6070 NEXT Y,X
6080 CLOSE
6090 I=1:X=X-1:GOTO 2000
7000 '
7010 '  SAVE DATA- NAME CHECK
7020 '
7040 PRINT@448,"IS '";N$;"' CORR
ECT NAME?":PRINT@480,"(Y/N) ";
7050 IN$=INKEY$:IF IN$="" THEN 7
050
7060 IF IN$="N" GOSUB 7500 ELSE
IF IN$="Y" GOSUB 7600:RETURN ELS
E IF IN$<>"Y" THEN 7050
7070 GOTO 7040
7500 PRINT@448,STRING$(45,32);:P
RINT@448,"CORRECT NAME: ";:Z=8:A
=451:GOSUB 1000
7510 N$=T$:IF N$="" OR VAL(LEFT$
(N$,1))>0 THEN 7500 ELSE RETURN
7590 '
7600 '  SAVE
7610 '
7620 PRINT@448,STRING$(40,32);:P
RINT@461,"SAVING"
7630 OPEN "O",#1,N$
7640 FOR F=1 TO X:FOR Y=1 TO 5
7650 IF Y<4 THEN PRINT#1,A$(F,Y)
 ELSE PRINT#1,A(F,Y)
7660 NEXT Y,F
7670 CLOSE:RETURN
8000 '
8010 '      PRINT ON PAPER
8020 '
8030 PRINT@457,"PRINT: SURE ?"
8040 IN$=INKEY$:IF IN$="" THEN 8
040
8050 IF IN$="N" THEN RETURN ELSE
 IF IN$<>"Y" THEN 8040
8060 PRINT@449,"ALIGN PAPER==> P
RESS <ENTER>";:LINE INPUT IN$
8070 PRINT#-2:PRINT#-2:PRINT#-2,
"RECORD: ";N$
8080 PRINT#-2,"DESCRIPTION";TAB(
23)"SERIAL#";TAB(38)"MODEL";TAB(
51)"NO.";TAB(60)"VALUE";TAB(68)"
TOTAL VALUE"
8085 PRINT#-2,STRING$(79,"-")
8090 FOR I=1 TO X
8100 PRINT#-2, A$(I,1);TAB(17) A
$(I,2);TAB(35) A$(I,3);TAB(52) A
(I,4);:PRINT#-2, TAB(59);:PRINT#
-2,USING"$$#####.##";A(I,5);:PRIN
T#-2,TAB(68);:PRINT#-2,USING"$$#
####.##";A(I,4)*A(I,5)
8110 NEXT I
8120 RETURN
```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```
10000 '
10010 '    DELETE DATA
10020 '
10030 PRINT@457,"DELETE (Y/N)?"
10040 IN$=INKEY$:IF IN$="" THEN
10040
10050 IF IN$="N" OR X<1 THEN RET
URN ELSE IF IN$<>"Y" THEN 10040
10060 FOR C=I TO X:FOR Y=1 TO 5
10070 A$(C,Y)=A$(C+1,Y):A(C,Y)=A
(C+1,Y)
10080 NEXT Y,C
10090 X=X-1:IF I>1 THEN I=I-1
10100 RETURN
10110 '
10120 '  END
10130 '
10140 CLS:PRINT@237,"STOP!"
10150 PRINT@293,"ARE YOU SURE YO
U WANT"
10160 PRINT@326,"TO DO THIS ? (Y
/N) "
10170 IN$=INKEY$:IF IN$="" THEN
10170
10180 IF IN$="Y" THEN END ELSE I
F IN$="N" THEN 2000 ELSE 10170
10190 END
10200 '
10210 '  INPUT DATA
10220 '
10230 CLS
10240 PRINT@131,"RECORD NAME: ";
:A=131:Z=8:GOSUB 1000:N$=T$:IF N
$="" OR VAL(LEFT$(N$,1))>0 THEN
10240
10250 CLS
10260 X=X+1:Y=1:IF X>50 THEN RET
URN
10270 PRINT@6,"PRESS <ENTER> TO
QUIT"
10280 PRINT@64,"DESCRIPTION: ";:
A=64:Z=15:GOSUB 1000:A$(X,Y)=T$:
IF A$(X,1)="" THEN I=X-1:X=X-1:R
ETURN
10290 PRINT@6,STRING$(21,32)
10300 Y=Y+1
10310 PRINT@96,"SERIAL NO.: ";:A
=96:Z=15:GOSUB 1000:A$(X,Y)=T$
10320 Y=Y+1
10330 PRINT@128,"MODEL: ";:A=128
:Z=15:GOSUB 1000:A$(X,Y)=T$
10340 Y=Y+1
10350 PRINT@160,"NO. OWNED: ";:A
=160:Z=4:GOSUB 1000:A(X,Y)=VAL(T
$):IF A(X,Y)<1 THEN 10350
10360 Y=Y+1
10370 PRINT@192,"VALUE OF EACH:
";:A=192:Z=6:GOSUB 1000:A(X,Y)=V
AL(T$):IF A(X,Y)<.01 THEN 10370
10380 A(X,Y+1)=A(X,Y)*A(X,Y-1)
10390 GOTO 10250
10400 '
10410 '    INTRODUCTION
10420 '
10430 '
10440 CLS:CLEAR 1000:DIM A$(50,6
),A(50,6):P$="=>"
10450 PRINT@97,STRING$(29,131):P
RINT@97,CHR$(138);:PRINT@129,CHR
$(138);:PRINT@161,CHR$(138);:PRI
NT@162,STRING$(28,140);:PRINT@12
5,CHR$(133);:PRINT@157,CHR$(133)
;:PRINT@189,CHR$(133);
10460 PRINT@130,"THE ELECTRONIC
FILE CABINET";
10470 PRINT@266,"BY DAN DONER"
10480 PRINT@324,"NEW RECORD OR O
LD RECORD":PRINT@364,"(N/Ø) ?"
10490 IN$=INKEY$:IF IN$="" THEN
10490
10500 IF IN$="Ø" THEN GOSUB 6000
:GOTO 2000 ELSE IF IN$="N" THEN
GOSUB 10200:GOTO 2000 ELSE 10490
```

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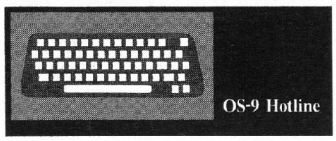

Configuring a new Boot Disk

I upgraded my CoCo 3 to 512K and added a second disk drive. I also purchased OS-9 and am having great difficulty configuring a working system disk to support the double-sided drives.

I am able to boot OS-9 and run `config`, *and go through the steps to create a new boot disk. When choosing the device descriptors, I select* `d0_40d`, `d1_40d` *and* `ddd0_40d`. *After I finish selecting the descriptors, I get the message:*

```
Use (CAUTION): OS9GEN </devname>
[-s] ...
reads (stdinput) pathnames until
EOF,
merging paths into new OS9Boot f
ile.
-s=single drive operation
ERROR #215
```

Here everything comes to a screeching halt and I get the OS9: prompt. I have gone through every issue of THE RAINBOW *since February 1989 and read everything on OS-9 in those issues. I have* The Complete Rainbow Guide to OS-9 Level II *and* The BASIC09 Tour Guide.

David Bakker
Hamilton, Michigan

If the only modification you want to make is to change the disk descriptors to use 40-track double-sided drives, it may be easier (and faster) to patch the descriptors in memory and use `cobbler` to save the changes. To do this, boot OS-9 from a backup of your master disk and issue these commands, pressing ENTER after each:

```
modpatch
l dd
c 14 03 00
c 18 23 28
c 19 00 01
v
l d0
c 14 03 00
c 18 23 28
c 19 00 01
v
l d1
c 14 03 00
c 18 23 28
c 19 00 01
v
```

CTRL-BREAK

This modifies the `dd`, `d0` and `d1` descriptors for 40-track, double-sided drives stepping at 6 milliseconds. Note that when you enter `v` to update the module CRC, the cursor stays on the same line — keep typing the remainder of the commands. The last line means to press CTRL and BREAK simultaneously to exit `modpatch`. After you've made these changes, insert a blank disk in Drive `/d1` and issue the command:

```
format /d1 r 2 '40' "OS-9 Boot D
isk"
```

This formats a 40-track double-sided disk with *OS-9 Boot Disk* as the volume label. After the disk is formatted and you get the OS9: prompt back, enter:

```
cobbler /d1
```

This command stores the OS-9 Kernel on Track 34 and creates the file `OS9Boot` on the disk in Drive `/d1`.

The final step is to copy all the files on the old boot disk to the new boot disk. The easiest way to do this is to use `dsave`. With the old boot disk in Drive `/d0` and the new boot disk in Drive `/d1`, enter:

```
chd /d0
dsave /d0 /d1 ! shell
```

Ordinarily, `dsave` generates the commands necessary for copying all the files from one disk to another, but does not actually copy the files. For this reason, the output of `dsave` is piped to the input of `shell` in the above command line (this is what the exclamation point means), so all the commands generated by `dsave` are executed immediately. Once this process has finished, you'll have a 40-track, double-sided boot disk — you may also want to copy `basic09`, `runb`, `gfx2`, `inkey` and `syscall` from the BASIC09/Config disk onto the new boot disk.

In Search of Software

In the August issue of OS-9 Hotline, you responded to Mr. Pratt's letter with some good information for sources of serious applications. You also mentioned The OS-9 Sourcebook *from Microware. I cannot find an address for Microware anywhere. Can you tell me how to get in touch with them? I would like to obtain a copy of this book.*

George Ramsower III
San Antonio, Texas

You can contact Microware by calling (515) 244-1929 or by writing

Microware Systems Corporation
1900 Northwest 114th Street
Des Moines, IA 50322

Obtaining the Cursor Position

Many times while using BASIC09 *I have come across the need to get the current cursor position while in a program. After studying the OS-9 manual and reading many articles, I cannot find a way to do this. Is there a system call or some other way that I can get the current cursor position? Also, is there a way of simulating the* `HSTAT` *command in* BASIC *so I can make a program read what is printed on the screen, aside from directly peeking the screen's address? Any help would be most appreciated.*

Aaron Yates
Richmond, Virginia

If you are using a VDG graphics screen, you can use the `SS.DStat` get-status call to obtain the position of the graphics cursor, the address of the graphics screen, and the color code of the pixel at the cursor address. For a VDG text screen, you can use the `SS.Cursr` get-status call to obtain the character code of the character at the current cursor position, and the position of the cursor. Unfortunately, no similar system calls exist to obtain the current cursor position for windows.

The Nill Devices

What are `nildrv.dr` *and* `nil.dd` *that come with the* Development System*? I can't find them in the manual and all the help message tells you is that they "... are usually used for redirection."*

Michael Wright
Nacogdoches, Texas

The `/nil` device is what I affectionately refer to as "OS-9's great bit bucket." Any data you send to `/p` magically appears on the printer, and any data you send to `/term` magically appears

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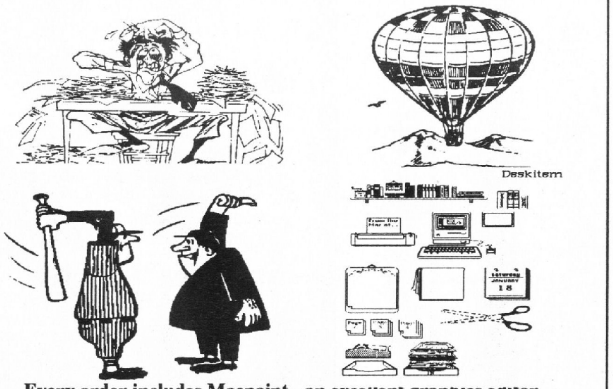

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on the screen. The `/nil` device is much different in that any data sent to `/nil` goes absolutely nowhere. This is handy for those occasions when you want to run a command but have no desire to see its output on the screen.

Swapping Disks

? *How can I run applications with OS-9? For example, I tried to run* Color Computer Artist *by Tandy. This program works in a graphics window, but I don't know how. The manual says that it can be copied to the customized OS-9 boot disk and to run* `artist` *once it has been copied to the* `CMDS` *directory by typing* `artist`. *When I boot OS-9 to run* BASIC09, *I insert the* BASIC09/Config *disk in the drive, type* `basic09` *and get Error #216. I tried again and again but the error continues.*

Jose Tores Rivera
Naranjito, Puerto Rico

a Any time you insert a new disk in the drive, you need to tell OS-9 where the `CMDS` directory is located on the new disk and which directory you want to use for data storage and retrieval. For example, to run BASIC09 you would insert the BASIC09/Config disk into Drive `/d0` and issue these commands:

```
chd /d0
chx /d0/cmds
basic09
```

Unless you change the current data and current execution directories, OS-9 doesn't know where the commands and executable programs are located on that disk.

Have you a burning question regarding some aspect of the OS-9 operating system? Send it to us and we'll do our best to answer it for you. Direct your inquiries to OS-9 Hotline, THE RAINBOW, 9509 U.S. Hwy. 42, P.O. Box 385, Prospect, KY 40059.

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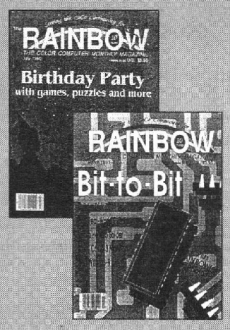

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CoCo Consultations

More Memory for the CoCo 2?

Q *Can I upgrade my CoCo 2 to 128K using the chips I took out of my CoCo 3 when I upgraded it to 512K?*

E. Oelschalger
Pittsburgh, Pennsylvania

A No. The ability to increase the memory of any specific computer is dependent not only on the chips available, but also on the memory-management circuitry within the computer. The CoCo 1 and 2 are designed to handle no more than 64K of memory and would require extra circuitry to support more. As an historical note, memory upgrades for up to 256K were at one time available for the CoCo 1 and 2. Very little software was written to support and take advantage of these upgrades, however; and they faded to obscurity with the advent of the CoCo 3.

Printing in Parallel

Q *I have a Blue Chip M10/NLQ printer that has a 36-pin parallel port and a 6-pin Commodore-64 serial port on it. How can I use this with a CoCo 3?*

Brandon Broyles
The Cobry, Texas

A You cannot use the 6-pin port because the serial format for a Commodore-64 is electrically different from that used by most other computers. You can use the 36-pin parallel port on that printer, but you'll need to buy a serial-to-parallel converter (such as those sold by Dayton Associates and CoCoPRO!).

DC Modem Pak and Downloading

Q *I have a DC Modem Pak and an FD-500 disk drive, but I have no Multi-Pak Interface. I find myself unable to download anything from any online system. What do I need?*

Donald G. Mayhew (LUPIS)
Lakewood, Colorado

A There are several ways you can proceed to fix the situation. By far the least expensive approach would be to temporarily forget about the DC Modem Pak and purchase a 1200- or 2400-bps external modem. This can then be connected to the 4-pin serial port on the rear of the CoCo, using a special 4-pin DIN to DB-25 cable. The pin-out for this cable is as follows:

CoCo DIN	Modem DB-25
1	8
2	3
3	7
4	2

With the hardware in place, get a decent CoCo 3 terminal package. There are several excellent shareware programs (*Delphiterm*, *Ultimaterm* and *Greg-E-Term*) that support operation of an external modem at 1200 and 2400 bps with the internal serial port. There are also several fine commercial terminal programs for the CoCo 3 that support 1200- and 2400-bps operation via the bit-banger port. Two of these are *VTerm* (available from CoCoPRO!) and *Deluxe Term* (available from Cer-Comp). Of course, for printing, you'll need to either switch connectors or buy or make a switch box to go between the printer and the modem.

You might be able to trade the unused DC Modem Pak to CoCoPRO! for mer-

chandise, or (as another approach to your problem) you can pay them to turn it into an RS-232 pack. Then if you ever get a Multi-Pak Interface, Slot Pak or Y cable, you can use the converted pack with your modem to permit smoother operation and free the serial port for the printer.

On the 63B09E Front

I've heard about the Hitachi 63B09E (a CMOS version of the 68B09E) not merely emulating the 6809, but actually having considerably more registers and commands. Is this so? Where can I get one?

Dennis McMillian (COCOKIWI)
Pittsburg, California

A Kevin Darling (DARLING) recently circulated on the CoCo mailing list a document of over a dozen pages written by Hirotsugu Kakugawa of the Graduate School of Engineering of Hiroshima University in Japan. This document (now available on Delphi in the Hardware Hacking database of the CoCo SIG and in the General topic area of the OS-9 SIG) details the "secret" features of the 6309. In summary, in addition to emulating the 6809, the 6309 operates as a low-power CMOS chip and is capable of cycle speeds of 3 MHz or more. The chip has these special properties:

- two 8-bit accumulators, one 8-bit register and one 16-bit register
- two modes of operation: 6809 emulation and native mode
- reduced execution cycles in native mode
- more instructions, including 16-bit-by-16-bit multiplication, 32-bit-by-16-bit division, more inter-register operations, bit-manipulation instructions compatible with the 6801, and block-transfer operations
- error trapping of illegal instructions, including divide by zero

Details of the "secret" features are in large part explained in the document by Hirotsugu. A 63B09E can literally be dropped into a CoCo 3 (provided you've removed the original 68B09E chip and put a socket in its place). No other hardware modifications are needed. I'm told by Brother Jeremy (REVWCP) that you can order 63B09E's in quantity one from Summer Inc. in Illinois (708-991-8500).

Joystick Sticks

The vertical axis of my right joystick is stuck at a value of 25 when I read the joystick. The horizontal axis works fine, as do both axes of the left joystick. I read a long time ago that an LM3900 chip is used in the CoCo 1 joystick circuit, but I cannot find such a chip in the CoCo 3.

Also, my DMP-110 is behaving oddly. In self-test mode, it prints part of the top of each row of characters at the bottom of the character. Any suggestions?

Roy Wilson
El Reno, Oklahoma

A First swap the left and right joysticks to see whether the problem follows the joy-stick, or whether it stays with a given joy-stick port on the CoCo. If the problem is in the joystick, you have a bad joystick cable or a bad connection inside the joystick. Inside the joysticks are two 10,000-ohm potentiometers mechanically linked to the axes of motion. Look for a defective mechanical linkage. Use a standard ohmmeter to find breaks in the cable, a defective potentiometer or a broken wire that should be connected to the potentiometer.

If the problem is with the CoCo 3 joystick port, get a schematic for the CoCo 3 (available in the Service Manual for the CoCo 3, which you can order through Radio Shack stores). Carefully check continuity from the joystick connector to IC7 (SC77526). This is a custom chip specific to the CoCo 3. (Tandy "drew" a line around much of the discrete components of the joystick and cassette circuitry of the CoCo 1, and stuffed it all into this one custom chip. If the problem is in a chip, it most likely is in this chip. This chip is available only from Tandy National Parts, if indeed it is still available at all.

As for the printer, I fear it is likely to be unrepairable. Your problem sounds like a defect in the "computer" that lives inside the printer.

Bump Off the 6809

I accidentally bumped my disk controller when it was plugged into my Slot Pak and my CoCo 3. Now when the computer and that controller are used together, the drive just spins. It does not work. The disk controller appears to work fine when used with my spare CoCo 3. Any suggestions?

Charles Rempel
Plum Coulee, Manitoba
Canada

A It sounds like you have damaged the 68B09E chip in your CoCo 3. This often happens when a card is jostled in a Multi-Pak Interface or Slot Pak. The 68B09E chip must be removed. Destructive removal is best: Clip all pins and remove the chip, then use a soldering iron and needle-nose pliers to remove each pin from the circuit board. When finished, clean all the holes with a solder sucker, install a 40-pin socket, and put a new 68B09E chip in it.

Drive Won't Format Disks

I have a Tandy FD-501 disk drive that reads and writes files but will not properly format diskettes. What is the problem, and how can I fix it?

Ben Culwell
Marion, Ohio

A This is a problem about which readers frequently write. Disk drives do not use the index pulse signal when reading and writing sectors (files). This signal is used only for writing entire tracks (formatting). Thus, your problem is with the index pulse, either in the drive, the cable or the controller card. On the FD-501 controller, the index signal (Pin 8 of the 34-pin connector) goes straight to the floppy-disk controller chip, although it is pulled High by a resistor. Some Delphi members have reported to me that on their controllers they found a short that was connecting Pin 8 of the 34-pin connector to ground, causing the problem you describe. To locate the problem, you need to use an ohmmeter (and perhaps an oscilloscope) to check the index-pulse circuit down the line. You may also want to swap a known good controller for the suspect one, and the same for your drive and cable (one at a time) to try to determine where the problem is.

Martin H. Goodman, M.D., a physician trained in anesthesiology, is a longtime electronics tinkerer and outspoken commentator — sort of the Howard Cosell of the CoCo world. On Delphi, Marty is the SIGop of THE RAINBOW's CoCo SIG. His non-computer passions include running, mountaineering and outdoor photography. Marty lives in San Pablo, California.

CoCo III Tool Kit

Disk Commands
Backup, Initialize, Directory, Verify, Compare, Search, Edit, Erase, Speed Test, Step Rate Test, Gran Table Analysis & Repair

File Commands
Arcive, Copy, Kill, Rename, Erase, View, Edit, Print, Compare, Salvage, Search, Verify, Test Arcive, Un-Arcive, Xmodem Send/Rec.

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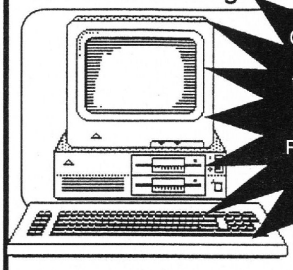

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Next you will enter a Section and find a number of entries written by our CoCo Friends from all over the world. Each issue of CFDM contains from 60 to 80 entries. Some sections contain documentation about the many programs and graphics found on the "flip-side" of CFDM.

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Directory *continued from Page 1*

press ENTER, then enter the three-character extension.

C (Copy) — copies the selected file from one drive to another.

K (Kill) — erases the selected file from the disk directory.

S (Scan) — views the contents of the selected file onscreen. Scans ASCII and binary files, though file bytes with values less than 32 and greater than 127 are not displayed as characters. *Warning: Attempting to scan CoCo Max III files will lock up the computer.*

D (Drive) — selects a new drive. Also use this option to view a new disk in the same drive; just reselect the current drive.

X (Disk Name) — adds a name (up to 26 characters) to the disk. (I really hate pulling a disk out of the drive just to read its label.) The disk name, which can be changed at any time, is stored on Track 17, Sector 1 of the disk in the current drive. Some commercial software uses this area, as do some other system enhancement programs. If in doubt, use a disk editor to make sure this area is clear before proceeding. *Warning: Do* not *attempt to name OS-9 disks with Directory Master.* Press ENTER by itself to abort this option.

V (Directory) — lists the directory on a 32-column screen. This option is particularly useful when you need to see the standard directory information (file type, format and size).

Q (Quit) — exits *Directory Master* and returns to BASIC. All system enhancements remain in effect, but *Directory Master* is removed from memory.

As implied above, several system enhancements are poked into memory when you first run *Directory Master.* These are described in the remarks imbedded in Listing 1, so I won't cover them here. But do take a look at them — you may find them suitable for use in other programs.

While *Directory Master* includes many Are You Sure? prompts, no fancy error trapping is provided by the program. If an error occurs, the program will abort much as if you had selected the Quit option.

Feel free to modify *Directory Master* to suit your needs. Ideas for enhancing the program include (you got it) better error trapping and arrow-key and/or joystick control. I would appreciate hearing your comments, suggestions and questions, and would like to see any modifications you make. I hope *Directory Master* is as helpful to you as it has been to me.

The Color Computer is currently Dwight Stegall's only hobby, although he has enjoyed operating CBs and amateur radio for several years. He has been a BASIC programmer for seven years. He may be contacted at 624 4th Avenue, East Moline, IL 61244. Please include an SASE when requesting a reply.

CoCo 3 Disk

Listing 1: DMASTER

```
1 'DISK MASTER
2 'BY DWIGHT L. STEGALL
3 'COPYRIGHT (C) 1992
4 'BY FALSOFT, INC.
5 'RAINBOW MAGAZINE
10 IFPEEK(33021)<>50THENCLS:PRIN
T"THIS PROGRAM WILL NOT FUNCTION
  WITHOUT THE COLOR COMPUTER3.":
PRINT:CLEAR200:NEW ELSEONERRGOTO
945:POKE41382,255:POKE41384,1
15 '*** MAKE SYSTEM CHANGES
20 POKE41598,255:POKE41599,255:V
ERIFYON:POKE65496,0:POKE65344,0:
POKE65497,0:POKE41954,250
25 POKE58953,16:RGB 'FORCE CMP &
 RGB TO RESET ALL 16 PALETTES IN
STEAD OF 15
30 WIDTH40:POKE65434,0:GOSUB880
35 A$="1854096063002953532000636
00954186208":A=58964:FORI=1TOLEN
(A$)STEP2:B$=MID$(A$,I,2):B=VAL(
B$):POKEA,B:A=A+1:NEXT 'PALETTE
VALUES FOR CMP & RGB
40 POKE38543,33:POKE38563,33:PCL
EAR0 'PATCH PCLEAR TO INCLUDE 0
45 POKE1022,PEEK(114):POKE1023,P
EEK(115):POKE114,3:POKE115,249:P
OKE1017,18:POKE1018,127:POKE1019
,255:POKE1020,223:POKE1021,126 '
RESET PROTECTION
50 POKE63468,0:POKE63503,0:POKE6
3567,0:POKE63644,0:POKE63771,0 '
TURNS OFF 40 & 80 COLUMN CURSOR
DURING PROGRAM OPERATION EXCEPT
AT AN INPUT AND A LINEINPUT LIKE
 IN WIDTH32. ADOS3'S "MENU" UTIL
ITY WILL DESTROY THESE POKES.
55 CLEAR200,32255:POKE32517,13:F
ORI=32518TO32523:READB$:POKEI,AS
C(B$):NEXT:POKEI,13:POKEI+1,0:PO
KE44151,127:POKE44152,5:DATA R,E
,A,D,Y,!
60 IFPEEK(41602)=23THEN80 'IF AD
OS3 THEN BYPASS NEXT 3 LINES
65 'SETS 6MS DISK STEP RATE IF Y
OU ARE NOT USING ADOS-3
70 IFPEEK(49474)<>48THENDB=1 'DI
SK BASIC 1.1 IF <>48
75 IFDB=1THEN POKE55318,20:POKE5
5232,0 ELSEPOKE55075,20:POKE5498
9,0
80 FORI=55671TO55675:READA$:POKE
I,ASC(A$):NEXT:DATAG,R,A,N,S 'CH
ANGES 'FREE' TO 'GRANS'
85 POKE65496,0:LOADM"STRDMOD3":C
LEAR10000:ONERRGOTO945:HI=65497:
LO=65496:POKEHI,0:POKE235,0:DIMA
$(69),N(69),T$(69),E$(69),P$(69)
,F(69)
90 POKE61203,196 'FIX THE HPUT "
NOT" OPTION
95 POKE62861,189:POKE62862,244:P
OKE62863,204 'FIX HDRAW BUG
100 POKE63164,255 'EXTEND 40 & 8
0 COLUMN "CLS" CHOICES FROM 1-8
TO 1-255
105 GOSUB890:GOSUB900:HBUFF0:HBU
FF2,320:HBUFF3,1250:HBUFF4,1250:
HBUFF5,3840:HCOLOR1,0:HSCREEN3:H
GET(0,0)-(319,95),5
110 '*** WHEN USING RUN, LOAD, N
AME, COPY, SCAN, AND KILL USE TH
E SPACEBAR TO SELECT FILENAMES
115 '*** MAIN SCREEN
120 POKEHI,0:HCLS1:HGET(0,0)-(43
7,15),4:HCOLOR0:FORI=0TO23:HPRIN
T(0,I),STRING$(11,92):HPRINT(69,
I),STRING$(11,92):NEXT:GOSUB910
125 HCOLOR0:HPRINT(14,19),"Direc
tory Master V1.01 written by: Dw
ight L. Stegall":HPUT(104,160)-(
535,175),4,NOT:HCOLOR1:HPRINT(15
,20),"R=Exec     L=Load     N=Fn
me     C=Copy     K=Kill":HPRINT
(15,21),"S=Scan     D=Driv     X
=Dnme     V=Drty     Q=Qui
130 GOSUB335:HPUT(200,16)-(215,1
51),4:HPUT(312,16)-(327,151),4:H
PUT(424,16)-(439,151),4:HGET(104
,16)-(535,83),5:RGB:GOSUB245:GOS
UB215:GOSUB275
135 POKE282,255:HI=65497:LO=6549
6:POKELO,0:POKE135,0:DN=PEEK(235
):DN$=":"+CHR$(48+DN)
140 X$=INKEY$:IFX$=""THEN140ELSE
POKEHI,0
145 IFX$="R"THENAR=1:K$="EXEC":G
OSUB535:GOSUB365:GOTO585
150 IFX$="L"THENAR=2:K$="LOAD":G
OSUB535:GOSUB365:GOTO615
155 IFX$="N"THENAR=3:K$="NAME":G
OSUB535:GOSUB365:GOTO645
160 IFX$="C"THENAR=4:K$="COPY":G
OSUB535:GOSUB365:GOTO685
165 IFX$="K"THENAR=5:K$="KILL":G
OSUB535:GOSUB365:GOTO725
170 IFX$="S"THENAR=6:K$="SCAN":G
OSUB535:GOSUB365:GOTO735
175 IFX$="D"THENAR=7:GOSUB535:GO
SUB200:GOSUB535:GOTO135
180 IFX$="X"THENAR=8:GOSUB535:GO
TO805
185 IFX$="V"THENAR=9:GOSUB535:GO
TO825
190 IFX$="Q"THENHGET(468,168)-(5
22,175),2:HPUT(468,168)-(522,175
),2,NOT:GOSUB355:GOSUB355:GOTO94
5 ELSEFORI=1TO10:PALETTE1,RND(63
):NEXT:RGB:POKELO,0:POKE135,0:GO
TO135
195 '*** SELECT WORKING DRIVE
200 HCOLOR0:HPRINT(15,22),"Which
 drive do you need? 0,1,2,3
205 EXEC44539:Z=PEEK(135):IFZ<48
ORZ>51THEN205ELSEPOKE235,Z-48:GO
SUB345:GOSUB335:GOSUB245:GOSUB21
5:GOSUB275:RETURN
210 '*** PRINTS HEADER
215 GOSUB320:HPUT(104,0)-(535,15
),4:HCOLOR1:HLINE(520,0)-(520,15
),PSET:HCOLOR0:HPRINT(14,0),"THE
 CURRENT DISK NAME":HLINE(285,2)
-(304,4),PSET,BF:HPRINT(38,0),CH
R$(123)+" "+I$
220 HPRINT(13,1),"*":HPRINT(15,1
),"CURRENT DRIVE #"+RIGHT$(STR$(
DN),1):HPRINT(32,1),"***
225 IFN<10THENUJ$="0"+RIGHT$(STR
$(N),1)ELSEUJ$=RIGHT$(STR$(N),2)
230 IFGR<10THENUK$="0"+RIGHT$(ST
R$(GR),1)ELSEUK$=RIGHT$(STR$(GR)
,2)
235 HPRINT(36,1),"FILENAMES="+UJ
$:HCOLOR0:HPRINT(49,1),"***":HPR
INT(53,1),"FREE GRNS="+UK$:HPRIN
T(66,1),"*":RETURN
240 '*** READS FILENAMES FROM DI
SK
245 POKELO,0:FORI=1TO68:P$(I)=""
:NEXT:DN=PEEK(235):N=0:P=0:FORX=
3TO11:DSKI$DN,17,X,A$(1),A$(2):F
ORQ=1TO2:FORI=1TO128STEP32:N=N+1
:T$(N)=MID$(A$(Q),I,8):IFASC(T$(
N))=255THENN=N-1:GOTO260ELSEIFAS
C(T$(N))=0THENN=N-1:GOTO255
250 E$(N)=MID$(A$(Q),I+8,3):P$(N
)=T$(N)+"."+E$(N):F(N)=ASC(MID$(
A$(Q),I+11,1))
255 NEXTI,Q,X:POKEHI,0
260 IFP$(1)=""THENHCOLOR0:HPRINT
(15,22),"THERE ARE NO FILES IN D
RIVE #"+CHR$(DN+48):GOSUB355:POK
EHI,0:GOSUB345:GOSUB200:GOSUB535
:GOTO135
265 RETURN
270 '*** PRINTS FILENAMES ON SCR
EEN
275 POKEHI,0:GP=1:HCOLOR1:A=2:B=
1:CL=13
280 FORI=B TO N:HPRINT(CL,A),P$(
B):A=A+1:B=B+1
285 IFB>N THENRETURN
290 IFA>18THENGP=GP+1:GOTO300
295 NEXT:RETURN
300 IFGP=2THENA=2:CL=27:GOTO280
305 IFGP=3THENA=2:CL=41:GOTO280
310 IFGP=4THENA=2:CL=55:GOTO280E
LSERETURN
315 '*** READS DISK NAME ON TRAC
K #17, SECTOR #1.
320 H$="THIS DISK HAS NO NAME!":
DN=PEEK(235):POKELO,0:GR=FREE(DN
):DSKI$DN,17,1,I$,J$:POKEHI,0:PO
KE65344,0:IFLEFT$(I$,1)=CHR$(255
)THENI$=H$ ELSEIFLEFT$(I$,1)=CHR
$(32)THENI$=H$ ELSEI$=LEFT$(I$,2
6)
325 RETURN
330 '*** CLEARS FILENAME FIELD
335 HPUT(104,16)-(535,83),5:HPUT
(104,84)-(535,151),5:RETURN
340 '*** CLEARS ROWS 22 & 23
345 HPUT(104,176)-(535,191),4:RE
TURN
350 '*** PAUSE AFTER PRINTING ON
 SCREEN
355 FORT=1TO750:NEXTT:RETURN
360 '*** SELECTION OF FILENAMES
365 GP=1:AL=2:B=1:RX=104:RY=199
370 HGET(RX,AL*8)-(RY,AL*8+7),2:
HPUT(RX,AL*8)-(RY,AL*8+7),2,NOT:
POKE338,255:POKE345,255
375 IFPEEK(338)=191THENRETURN EL
SEIFPEEK(345)=247THENAL=AL+1:B=B
+1 ELSE375
380 HPUT(RX,AL*8-8)-(RY,AL*8-1),
2
385 IFB>N THEN365
390 IFAL>18THENGP=GP+1:GOTO400
395 GOTO370
400 IFGP=2THENAL=2:B=18:RX=219:R
Y=310:GOTO370
405 IFGP=3THENAL=2:B=35:RX=330:R
Y=421:GOTO370
410 IFGP=4THENAL=2:B=52:RX=441:R
Y=532:GOTO370ELSERETURN
415 '*** HSCREEN 'LINEINPUT' SIM
ULATION
420 POKE135,0:Y$="":Z$="":X=PEEK
(1024):Y=PEEK(1025):Z=PEEK(1026)
:FG=PEEK(1027):SL=X 'X=ROW POSIT
ION OF CURSOR, Y=ROW POSITION OF
 CURSOR, Z=AMOUNT OF CHARACTERS
THAT MAY BE INPUT AT ONE TIME, F
G=FOREGROUND COLOR
425 HCOLOR2:HPRINT(X,Y),CHR$(127
):HPUT(X*8,Y*8)-((X*8)+7,Y*8+7),
4:Y$=INKEY$:IFY$=""THEN425
430 IFY$=CHR$(255)THEN425
435 IFASC(Y$)=13ORASC(Y$)=8THEN4
45
440 IFASC(Y$)=21THENX=SL:HPUT(X*
8,Y*8)-((X+Z)*8,Y*8+7),4:GOTO420
 'SHIFT LEFT ARROW
445 IFY$=CHR$(13)THENPOKE282,255
:RETURN
450 IFY$=CHR$(8)AND LEN(Z$)=0THE
NX=SL:GOTO425 'LEFT TAB STOP FOR
 CURSOR
455 IFY$=CHR$(8)AND LEN(Z$)>0THE
NZ$=LEFT$(Z$,LEN(Z$)-1):HPUT((X*
8)-8,Y*8)-(X*8,Y*8+7),4:HCOLORFG
:X=X-1:GOTO425 'LEFT ARROW
460 Z$=Z$+Y$
465 IFLEN(Z$)>Z THEN470ELSEHCOLO
RFG:HPRINT(X,Y),Y$:X=X+1
470 IFLEN(Z$)>Z THENZ$=LEFT$(Z$,
Z):HPRINT(36,Y)," "
475 GOTO425
480 '*** ELIMINATE BRAIN MALFUNC
TION!
485 HCOLOR0:HPRINT(16,23),"ARE Y
OU SURE YOU WANT TO "+K$+" "+P$(
B)+"? [Y/N]":POKE135,0
490 X$=INKEY$:IFX$=""THEN490
495 IFX$="Y"THENGOSUB345:IFP$(2)
="" AND AR=5THENRETURN ELSEIFAR=
4THENRETURN ELSEGOSUB535:RETURN
500 IFX$="N"THENGOSUB345:GOSUB55
5:GOSUB535:GOTO135 ELSEPOKE135,0
:GOTO490
505 '*** ELIMINATE IGNORANCE ATT
ACK!
510 HCOLOR0:HPRINT(16,23),"ARE Y
OU SURE YOU WANT TO NAME THIS DI
SK? [Y/N]":POKE135,0
515 X$=INKEY$:IFX$=""THEN515
520 IFX$="Y"THENGOSUB345:GOSUB53
5:RETURN
525 IFX$="N"THENGOSUB345:GOSUB53
5:GOTO135 ELSEPOKE135,0:GOTO515
530 '*** INVERT & REINVERT COMMA
ND LINE
535 IF AR=1THEN X=15:Y=21:Z=20 E
LSEIFAR=2THEN X=26:Y=32:Z=20 ELS
EIFAR=3THEN X=37:Y=43:Z=20 ELSEI
FAR=4THEN X=48:Y=54:Z=20 ELSEIFA
R=5THEN X=59:Y=65:Z=20
540 IFAR=6THEN X=15:Y=21:Z=21 EL
SEIFAR=7THEN X=26:Y=32:Z=21 ELSE
IFAR=8THEN X=37:Y=43:Z=21 ELSEIF
AR=9THEN X=48:Y=54:Z=21
545 HGET(X*8-4,Z*8)-(Y*8+3,Z*8+7
),2:HPUT(X*8-4,Z*8)-(Y*8+3,Z*8+7
),2,NOT:RETURN
550 '*** RESET FILE NAME FIELD
555 HGET(RX,AL*8)-(RY,AL*8+7),2:
HPUT(RX,AL*8)-(RY,AL*8+7),2,NOT:
RETURN
560 '*** DUMP FILENAME TO TEMPOR
ARY BUFFER SO MEMORY CAN BE RE-E
STABLISHED WITH CLEAR200 AND PCL
EAR4
565 V=1536:FORI=1TO12:U=ASC(MID$
(P$(B),I,1)):POKEV,U:V=V+1:NEXT:
IFF(B)=0 OR F(B)=2THENGOSUB915:G
OSUB925:RETURN ELSERETURN
570 '*** RETREIVE FILENAME FROM
BUFFER
575 FORI=1536TO1547:P$(B)=P$(B)+
CHR$(PEEK(I)):NEXT:HBUFF0:DN$=":
"+CHR$(PEEK(235)+48):RETURN
580 '*** RUN A FILENAME
585 IFF(B)=0THENGOSUB485:WIDTH32
:GOSUB870:RGB:GOSUB605:GOSUB565:
CLEAR200:PCLEAR4:GOSUB575:POKE65
496,0:LOAD P$(B)+DN$,R
590 IFF(B)=2THENGOSUB485:WIDTH32
:GOSUB870:RGB:GOSUB605:GOSUB565:
CLEAR200:PCLEAR4:GOSUB575:PRINT:
PRINT"IF YOU GET A ?SYNTAX ERROR
 JUST TYPE: EXEC TO EXECUTE THE
```

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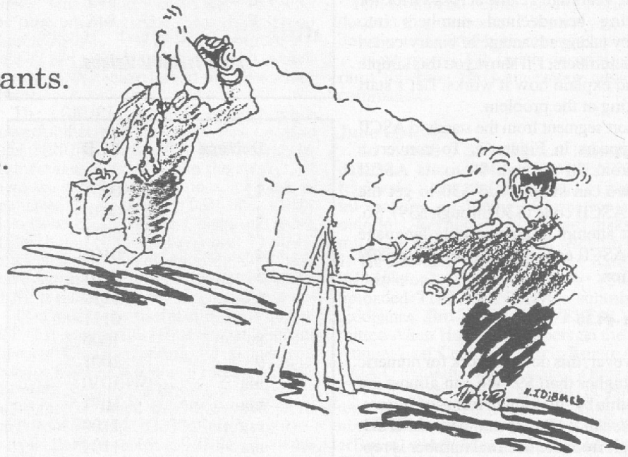

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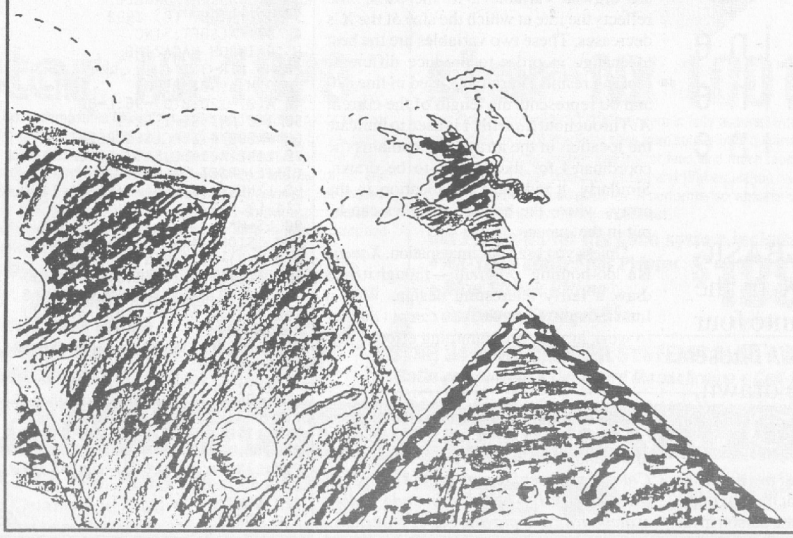

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```
FILE.":PRINT:POKE65496,0:LOADM P
$(B)+DN$:POKE65344,0:EXEC
595 IFF(B)=1THENHCOLOR0:HPRINT(1
5,22),"You cannot execute a data
 file!":SOUND2,20:FORI=1TO4:GOSU
B355:NEXTI:GOSUB345:GOSUB555:GOS
UB535:GOTO135
600 IFF(B)=3THENHCOLOR0:HPRINT(1
5,22),"You cannot execute a text
 editor source file!":SOUND2,20:
FORI=1TO4:GOSUB355:NEXTI:GOSUB34
5:GOSUB555:GOSUB535:GOTO135
605 PRINT"RUNNING: "P$(B)+DN$:GO
SUB915:POKE41598,3:POKE41599,3:R
ETURN
610 '*** LOAD A FILENAME
615 IFF(B)=0THENGOSUB485:WIDTH32
:GOSUB870:RGB:GOSUB635:GOSUB565:
CLEAR200:PCLEAR4:GOSUB575:POKE65
496,0:LOAD P$(B)+DN$
620 IFF(B)=2THENGOSUB485:WIDTH32
:GOSUB870:RGB:GOSUB635:GOSUB565:
CLEAR200:PCLEAR4:GOSUB575:POKE65
496,0:LOADM P$(B)+DN$:POKE65344,
0:END
625 IFF(B)=1THENHCOLOR0:HPRINT(1
5,22),"You cannot load a data fi
le!":SOUND2,20:FORI=1TO4:GOSUB35
5:NEXTI:GOSUB345:GOSUB555:GOSUB5
35:GOTO135
630 IFF(B)=3THENHCOLOR0:HPRINT(1
5,22),"You cannot load a text ed
itor source file!":SOUND2,20:FOR
I=1TO4:GOSUB355:NEXTI:GOSUB345:G
OSUB555:GOSUB535:GOTO135
635 PRINT"LOADING: "P$(B)+DN$:GO
SUB915:POKE41598,3:POKE41599,3:R
ETURN
640 '*** RENAME A FILE
645 HCOLOR0:HPRINT(19,22),"NEW F
ILE NAME:          .":HLINE(272,1
84)-(335,184),PSET:HLINE(343,184
)-(366,184),PSET:HPRINT(47,22),"
or hit [ENTER]":POKE1024,34:POKE
1025,22:POKE1026,8:POKE1027,0
650 GOSUB420:IFZ$=""THENGOSUB345
:GOSUB555:GOSUB535:GOTO135ELSEW$
=Z$
655 HCOLOR0:HPRINT(42,22),".":PO
KE1024,43:POKE1025,22:POKE1026,3
:POKE1027,0
660 GOSUB420:IFZ$=""THENGOSUB345
:GOSUB555:GOSUB535:GOTO135
665 HCOLOR1:HLINE(120,184)-(460,
184),PSET:GOSUB485:Y$=W$+STRING$
(8-LEN(W$),32)+"."+Z$:IFY$=P$(B)
THENHCOLOR0:HPRINT(15,22),"THE N
EW NAME MUST NOT BE THE SAME AS
 THE OLD NAME!":POKELO,0:FORT=1TO
3000:NEXT:POKEHI,0:GOSUB555:GOSU
B345:GOTO135
670 POKELO,0:RENAME P$(B)+DN$ TO
 Y$+DN$:POKE65344,0
675 POKEHI,0:GOSUB345:GOSUB335:G
OSUB245:GOSUB215:GOSUB275:GOTO13
5
680 '*** COPY A FILE
685 GOSUB485:HCOLOR0:HPRINT(15,2
2),"What is the target drive? 0,
1,2,3
690 EXEC44539:Z=PEEK(135):IFZ<48
ORZ>51THEN690ELSE S$=":"+CHR$(Z)
:S=Z-48:DN=PEEK(235):DN$=":"+CHR
$(DN+48):GOSUB535:GOSUB345
695 IFPEEK(41602)<>23THENPOKELO,
0:COPY P$(B)+DN$ TO P$(B)+S$:POK
EHI,0:POKE235,DN:POKE65344,0:GOS
UB555:GOSUB715:GOTO135 'CHECK FO
R ADOS3
700 GOSUB710:GOSUB880:WIDTH80:CL
S6:CMP:PALETTE3,36:LOCATE0,9:ATT
R5,3:PRINTSTRING$(31,32);:ATTR6,
5:LOCATE0,11:ATTR5,2:PRINTSTRING
$(31,32);:ATTR6,5:LOCATE0,10:ATT
R5,3:PRINT" ";:ATTR2,1:PRINT" CO
PYING "P$(B)+DN$" TO"S"";:ATTR5,
2:PRINT" ";
705 ATTR6,5:POKE65428,32:POKE654
29,2:LOCATE0,12:ATTR3,5,B:POKELO
,0:COPY P$(B)+DN$ TO P$(B)+S$:PO
KEHI,0:POKE65344,0:POKE235,DN:PO
KE59078,33:CLS:GOSUB880:HSCREEN3
:RGB:POKE59078,141:GOSUB555:GOSU
B715:POKE65428,126:POKE65429,126
:GOTO135
710 POKE57414,9:POKE63105,32:POK
E63112,38:POKE63113,0:POKE63601,
64:POKE63605,37:POKE63606,192:RE
TURN 'CONVERT 80X24 HIRES TEXT S
CREEN INTO 32X24 HIRES TEXT SCRE
EN (C) APRIL 1989 TIM RITTER
715 POKE57414,21:POKE63105,80:PO
KE63112,47:POKE63113,0:POKE63601
,160:POKE63605,46:POKE63606,96:R
ETURN 'RESET 32X24 HIRES TEXT SC
REEN TO 80X24 HI-RES TEXT SCREEN
720 '*** KILL A FILE
725 DN=PEEK(235):DN$=":"+CHR$(48
+DN):GOSUB485:POKELO,0:KILL P$(B
)+DN$:POKEHI,0:POKE65344,0:GOSUB
335:GOSUB245:GOSUB215:GOSUB275:G
OTO135
730 '*** SCAN A FILE
735 GOSUB485:GOSUB555:POKEHI,0:G
OSUB880:GOSUB790:WIDTH80:CLS6:CM
P:DN$=":"+CHR$(PEEK(235)+48)
740 LOCATE2,0:ATTR7,5:PRINTSTRIN
G$(28,42):LOCATE2,1:PRINT"* ";:A
TTR6,5:PRINT"SCANNING: "P$(B)DN$
;:ATTR7,5:PRINT" *":LOCATE2,2:PR
INTSTRING$(28,42)
745 LOCATE32,0:ATTR7,5:PRINTSTRI
NG$(30,42);:LOCATE32,1:PRINT"* "
;:ATTR6,5:PRINT"SPACE=PAUSE - EN
TER=RETURN";:ATTR7,5:PRINT" *";:
LOCATE32,2:PRINTSTRING$(30,42);
750 LOCATE16,4:ATTR2,1:PRINT"YEL
LOW=VALUE LESS THAN ASCII 32";:A
TTR0,5:LOCATE15,5:ATTR3,2:PRINT"
BLUE=VALUE GREATER THAN ASCII 12
7";:ATTR3,5:PRINT:PRINT
755 OPEN"I",#1,P$(B)+DN$:CLOSE:O
PEN"D",#1,P$(B)+DN$,1:POKE65344,
0:FIELD#1,1AS A$:FORX=1TOLOF(1):
GET#1:IFASC(A$)=13THENATTR3,5:PR
INT:ATTR3,5:GOTO770
760 IFASC(A$)<32THENATTR0,1:PRIN
T" ";:ATTR3,5:GOTO770
765 IFASC(A$)<128THENATTR3,5:PRI
NTA$; ELSEATTR3,2:PRINTA$;:ATTR3
,5
770 X$=INKEY$:IFX$=CHR$(32)THENP
OKELO,0:EXEC44539:POKEHI,0:POKE1
35,0
775 IFX$=CHR$(13)THENPRINT:CLOSE
#1:GOTO785
780 NEXT:POKE65344,0:ATTR3,5:PRI
NT:PRINT:CLOSE#1:LOCATE14,23:ATT
```

Feature Program

Skip a Line with BASIC09

I recently became interested in OS-9 (Level II) and have been playing with the various ways OS-9 allows you to work. Since my Disk BASIC word processor won't work with OS-9, I had to find another way to write notes and letters (I don't yet have an OS-9 word processor). I use OS-9's `build` command on an 80-by-24 text screen for this purpose.

The `build` command included with OS-9 allows you to create text files on disk. To use this tool, enter `build` followed by a filename. OS-9 responds by printing a question mark at the beginning of the next line. This tells you `build` is ready for you to enter text; just type what you want and press ENTER at the end of the line — another question mark appears allowing you to enter another line. At the end of the first line and periodically thereafter, OS-9 saves on disk (in the current data directory) the text you have entered. While the disk is spinning, OS-9 cannot receive characters from the keyboard — keep this in mind while entering your text. When you have entered the last line of text, press ENTER by itself on a new line and OS-9 closes the file, returning you to the OS9: prompt.

It is important to note that `build` does not support any form of editing. If you notice a mistake on a line you've already entered, you have to start the whole file over or use an editor to fix the mistake. You can use OS-9's `edit` command for this purpose.

After you have finished building a text file, you can display it onscreen by entering `list` followed by the filename. If the text is longer than the screen and happens to scroll off the top, enter `tmode pause` to turn on OS-9's page-pause feature. To get a hardcopy of the text, make sure your printer is online and enter

```
list filename >/p
```

The > symbol tells OS-9 to redirect the output of the `list` command to Device `/p`, the printer.

When I print program listings with my CoCo, I like the printout to be double-spaced. Rather than fool with the linefeed settings on my printer (and from within OS-9, using `tmode`), I wrote a BASIC09 program to handle the spacing for me. To use *Skip*, first enter the listing as shown using `build` or BASIC09's editor. Then, while in BASIC09, load the program and run it. You'll be prompted for the name of the program listing you want to print. That's all there is to it.

I also like my BASIC09 program listings to be formatted (indented and with offsets). To do this, I load the program in question into BASIC09 and enter `list >newfilename`, replacing *newfilename* with the new name under which I want the "listing" file saved. (Plain BASIC09 source-code files are unformatted — you may want to keep both copies of the listing.) Then I run *Skip* to print the listing.

Skip is useful for more than just printing program listings. In fact, the program can be used to double-space any standard text file. Just enter the name of the file when *Skip* prompts you for the program name.

The program listing for *Skip* is short and pretty easy to follow. Feel free to modify the program to suit your individual needs.

John Musumeci is a retired TV repairman whose sole hobby for the past eight years has been working with and programming the Color Computer. He may be contacted at 103-57 104 Street, Ozone Park, NY 11417, (718) 738-0212. Please include an SASE when requesting a reply.

CoCo 3

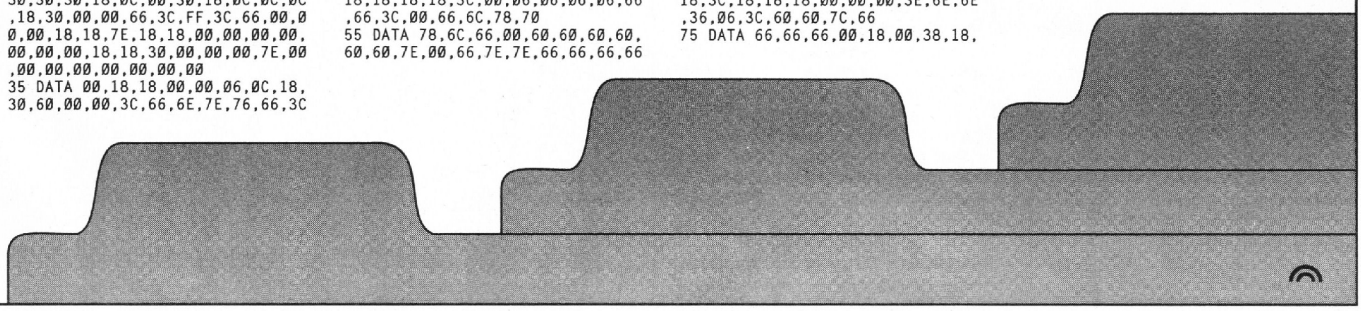
The Listing: `skip.b09`

```
PROCEDURE skip
0000        (* Written by John Musumeci
001B        DIM disk,printer:BYTE
0026        DIM program:STRING[160]
0032        DIM group1,group2:STRING[80]
0042        SHELL "display 0c"
0050        PRINT "Adjust Printer Paper."
0069        OPEN #printer,"/p":WRITE
0076        FOR x=1 TO 4 \ SHELL "display 0a" \NEXT x
00A1        INPUT "What is name of program:",program
00C1        FOR x=1 TO 5 \ SHELL "display 0a >/p" \NEXT x
00F0        aa=5
00F8        SHELL "display 0c"
0106        PRINT "P R I N T I N G . . . . ."
0123        OPEN #disk,program:READ
012F        WHILE EOF(#disk)<>TRUE DO
013B          READ #disk,program
0145          l=LEN(program)
014F          group1=LEFT$(program,80)
015A          PRINT #printer,group1;  \aa=aa+1
0171          IF aa=60 THEN GOSUB 30
0181          ENDIF
0183          SHELL "display 0d >/p"
0195          SHELL "display 0a >/p" \aa=aa+1
01B3          IF aa=60 THEN GOSUB 30
01C3          ENDIF
01C5          group2=RIGHT$(program,l-80)
01D6          IF l>80 THEN
01E3            GOTO 20
01E7          ENDIF
01E9 10       REM
01EF        ENDWHILE
01F3        CLOSE #disk
01F9        SHELL "display 0c"
0207        END
0209 20     PRINT #printer,group2;  \aa=aa+1
0223        IF aa=60 THEN GOSUB 30
0233        ENDIF
0235        SHELL "display 0d >/p"
0247        SHELL "display 0a >/p" \aa=aa+1
0265        IF aa=60 THEN GOSUB 30
0275        ENDIF
0277        GOTO 10
027B 30     FOR x=1 TO 12
0290          SHELL "display 0a >/p" \aa=5
02AA        NEXT x \ RETURN
```

```
R4,5:PRINT"PRESS ANY KEY TO RETU
RN TO THE MENU";:EXEC44539
785 POKEHI,Ø:POKE65344,Ø:CLS:GOS
UB880:POKE59078,33:HSCREEN3:GOSU
B795:RGB:POKE59078,141:GOTO135
790 POKE57414,19:POKE63105,64:PO
KE63112,44:POKE63601,128:POKE636
05,43:POKE63606,128:POKE63724,64
:RETURN 'CONVERT 80 X 24 HIRES T
EXT SCREEN INTO 64 X 24 HIRES TE
XT SCREEN (C) APRIL 1989 TIM RIT
TER
795 POKE57414,21:POKE63105,80:PO
KE63112,47:POKE63601,160:POKE636
05,46:POKE63606,96:POKE63724,80:
RETURN 'RESET 64x24 HI-RES TEXT
SCREEN TO 80x24 HI-RES TEXT SCRE
EN
800 '*** RENAME DISK (NOTE: YOU
MAY PRESS ENTER TO AVOID GIVING
THE DISK A NAME. THE FIRST CHARA
CTER MUST NOT BE A SPACE.)
805 HCOLOR0:HPRINT(14,22),"Disk
name:":HLINE(200,184)-(407,184),
PSET:HPRINT(52,22),"or hit [ENTE
R]":POKE1024,25:POKE1025,22:POKE
1026,26:POKE1027,0
810 GOSUB420:IFZ$=""ORLEFT$(Z$,1
)=CHR$(32)THENGOSUB535:GOSUB345:
GOTO135
815 HCOLOR3:HLINE(208,184)-(415,
184),PSET:GOSUB510:Y$=Z$+STRING$
(26-LEN(Z$),32)+STRING$(102,255)
:DN=PEEK(235):POKELO,Ø:DSKO$DN,1
7,1,Y$,STRING$(128,255):POKEHI,Ø
:POKE65344,Ø:GOSUB345:GOSUB215:G
OTO135
820 '*** DIRECTORY OF FILENAMES
825 GOSUB355:GOSUB535:GOSUB880:G
OSUB710:WIDTH80:CMP:CLS6:GOSUB32
Ø
830 ATTRØ,5:PRINT"***"I$;:LOCATE
29,Ø:PRINT"***":ATTR1,5:PRINT"
** DIRECTORY FOR DRIVE #";:PRINT
USING"#";DN;:PRINT" **":PRINT:AT
TR7,5:PRINT"  SPACE=PAUSE - OTHE
R=CONTINUE":ATTR6,5
835 POKE41590,19:POKELO,Ø:DIRDN:
POKEHI,Ø:IFPEEK(41602)<>23THENPR
INTUSING"GRANS = ##";GR
840 POKE65344,Ø:POKE41590,32:ATT
R4,5:LOCATE3,23:PRINT"PRESS ANY
KEY FOR THE MENU";:POKE135,Ø
845 A=443847:B=443897
850 LPOKEA,(LPEEK(A)+64)AND127:L
POKEB,(LPEEK(B)+64)AND127:IFINKE
Y$<>""THEN865ELSEA=A+2:B=B-2:IFA
<443873THEN850
855 A=443847:B=443897
860 LPOKEA,(LPEEK(A)-64)AND127:L
POKEB,(LPEEK(B)-64)AND127:IFINKE
Y$<>""THEN865ELSEA=A+2:B=B-2:IFA
<443873THEN860ELSE845
865 POKE59078,33:POKEHI,Ø:CLS:GO
SUB880:GOSUB715:HSCREEN3:RGB:POK
E59078,141:GOTO135
870 A$="1836110763310938001800630
0180038185409366327453800180063
00180038":A=58964:FORI=1TOLEN(A$
)STEP2:B$=MID$(A$,I,2):C=VAL(B$)
:POKEA,C:A=A+1:NEXT:RETURN 'RESE
T RGB AND CMP PALETTES TO STARTU
P VALUES.
875 '*** SET ALL PALETTES TO 'BL
ACK'. THIS WILL PREVENT STRANGE
COLOR FLASHES ON THE SCREEN WHEN
 SWITCHING FORM GRAPHICS SCREEN
TO TEXT SCREEEN AND RGB TO CMP A
ND BACK AGAIN.
880 FORI=ØTO15:PALETTEI,Ø:NEXT:P
OKE65434,Ø:RETURN
885 '*** USE WIDTH32 AS A TEMPOR
ARY 512 BYTE BUFFER TO DUMP ORIG
INAL VALUES OF CHR$(92) & CHR$(1
23) ON HSCREENS. NO MATTER WHAT
FONT YOU ARE USING IN THIS PROGR
AM THEY WILL ALWAYS BE RESET WIT
H THE CORRECT VALUES.
890 A=62077:D=33000:FORI=1TO8:C=
PEEK(A):POKED,C:A=A+1:D=D+1:NEXT
:A=62325:D=33009:FORI=1TO8:C=PEE
K(A):POKED,C:A=A+1:D=D+1:NEXT:RE
TURN
895 '*** CHANGE CHR$(92) TO RAND
OM GRAPHICS CHARACTER AND CHR$(1
23) TO BOLD RIGHT ARROW. THERE 1
8.5 TRILLION DIFERENT POSSIBILIT
IES FOR CHR$(92). NOTE: CHR$(92)
 PRINTS THE GRAPHICS ON BOTH SID
ES OF THE SCREEN.
900 FORI=62077TO62084:A=RND(256)
:IFA=256THENPOKEI,Ø:NEXT:RETURN
ELSEPOKEI,A:NEXT:POKE62325,8:POK
E62326,12:POKE62327,126:POKE6232
8,127:POKE62329,126:POKE62330,12
:POKE62331,8:POKE62332,Ø:RETURN
905 '*** RESET CHR$(92) & CHR$(1
23)
910 A=62077:D=33000:FORI=1TO8:C=
PEEK(D):POKEA,C:A=A+1:D=D+1:NEXT
:RETURN
915 A=62325:D=33009:FORI=1TO8:C=
PEEK(D):POKEA,C:A=A+1:D=D+1:NEXT
:RETURN
920 '*** RESET ADDRESSES 33000-3
3016
925 A=33000:POKEA,69:POKEA+1,88:
POKEA+2,84:POKEA+3,69:POKEA+4,78
:POKEA+5,68:POKEA+6,69:POKEA+7,6
8:POKEA+8,32:POKEA+9,67:POKEA+10
,79:POKEA+11,76:POKEA+12,79:POKE
A+13,82:POKEA+14,32:POKEA+15,66:
POKEA+16,65:RETURN
930 '*** IF YOU WOULD LIKE TO GE
NERATE A TEST DISK WITH 68 FILEN
AMES ON IT, FORMAT A DISK WITH D
SKINIØ AND DELETE ALL LINE NUMBE
RS IN THIS PROGRAM EXCEPT THE NE
XT LINE AND RUN IT
935 FORI=1TO68:PRINT"FILE "+RIGH
T$(STR$(I),2):SAVE"FILE "+RIGHT$
(STR$(I),2):NEXT:END
940 '*** LEAVE PROGRAM
945 POKE57556,55:HBUFF0:POKE5755
6,52:HBUFF0:WIDTH40:GOSUB915:GOS
UB925:GOSUB870:CLS11:ATTR3,2:POK
E41590,32:POKE41598,3:POKE41599,
3:POKELO,Ø:CLEAR200:RGB:NEW
```

Listing 2: STRDMOD3

```
1 'STRDMOD3 - SCREEN FONT
2 'BY DWIGHT L. STEGALL
3 'COPYRIGHT (C) 1992
4 'BY FALSOFT, INC.
5 'RAINBOW MAGAZINE
10 CLS:PRINT"POKING STRDMOD3 FON
T.....":PRINT:PRINT"WRITTEN BY:
DWIGHT L. STEGALL":FORI=61597TO6
2364:READA$:POKEI,VAL("&H"+A$):N
EXT
15 SAVEM"STRDMOD3",61597,62364,6
1597
20 CLEAR200:NEW
25 DATA Ø0,Ø0,Ø0,Ø0,Ø0,Ø0,Ø0,Ø0,
18,3C,3C,18,18,Ø0,18,Ø0,6C,6C,6C
,Ø0,Ø0,Ø0,Ø0,Ø0,36,36,7F,36,7F,3
6,36,Ø0,18,3E,58,3C,1A,7C,18,Ø0,
60,66,0C,18,30,66,06,Ø0,38,6C,6C
,3A,6E,66,3F,Ø0,18,18
30 DATA 30,Ø0,Ø0,Ø0,Ø0,Ø0,Ø0,0C,18,
30,30,30,18,0C,Ø0,30,18,0C,0C,0C
,18,30,Ø0,Ø0,66,3C,FF,3C,66,Ø0,0
0,Ø0,18,18,7E,18,18,Ø0,Ø0,Ø0,Ø0,
Ø0,Ø0,Ø0,18,18,30,Ø0,Ø0,Ø0,7E,Ø0
,Ø0,Ø0,Ø0,Ø0,Ø0,Ø0,Ø0
35 DATA Ø0,18,18,Ø0,Ø0,06,0C,18,
30,60,Ø0,Ø0,3C,66,6E,7E,76,66,3C
,Ø0,18,38,18,18,18,18,3C,Ø0,3C,6
6,06,3C,60,60,7E,Ø0,3C,66,06,1C,
06,66,3C,Ø0,0E,1E,36,66,7F,06,06
,Ø0,7E,60,7C,06,06,66
40 DATA 3C,Ø0,3C,66,60,7C,66,66,
3C,Ø0,7E,06,0C,18,30,30,30,Ø0,3C
,66,66,3C,66,66,3C,Ø0,3C,66,66,3
E,06,66,3C,Ø0,Ø0,18,18,Ø0,Ø0,18,
18,Ø0,Ø0,18,18,Ø0,Ø0,18,18,30,0C
,18,30,60,30,18,0C,Ø0
45 DATA Ø0,Ø0,7E,Ø0,7E,Ø0,Ø0,Ø0,
30,18,0C,06,0C,18,30,Ø0,3C,66,06
,0C,18,Ø0,18,Ø0,3C,66,06,36,6E,6
E,3C,Ø0,18,3C,66,66,7E,66,66,Ø0,
7C,66,66,7C,66,66,7C,Ø0,3C,66,60
,60,60,66,3C,Ø0,7C,66
50 DATA 66,66,66,66,7C,Ø0,7E,60,
60,78,60,60,7E,Ø0,7E,60,60,78,60
,60,60,Ø0,3C,66,60,6E,66,66,3C,0
0,66,66,66,7E,66,66,66,Ø0,3C,18,
18,18,18,18,3C,Ø0,06,06,06,06,66
,66,3C,Ø0,66,6C,78,70
55 DATA 78,6C,66,Ø0,60,60,60,60,
60,60,7E,Ø0,66,7E,7E,66,66,66,66
,Ø0,66,66,76,7E,6E,66,66,Ø0,3C,6
6,66,66,66,66,66,3C,Ø0,7C,66,66,7C,
60,60,60,Ø0,3C,66,66,76,7E,6E,3E
,Ø3,7C,66,66,7C,78,6C
60 DATA 66,Ø0,3C,66,60,3C,06,66,
3C,Ø0,7E,18,18,18,18,18,18,Ø0,66
,66,66,66,66,66,3C,Ø0,66,66,66,6
6,66,3C,18,Ø0,66,66,66,66,7E,7E,
66,Ø0,66,66,3C,18,3C,66,66,Ø0,66
,66,66,3C,18,18,18,Ø0
65 DATA 7E,06,0C,18,30,60,7E,Ø0,
3C,30,30,30,30,30,3C,Ø0,Ø0,Ø0,Ø0
,Ø0,Ø0,Ø0,Ø0,7E,3C,0C,0C,0C,0C,0
C,3C,Ø0,18,3C,66,Ø0,Ø0,Ø0,Ø0,Ø0,
Ø0,18,30,7E,30,18,Ø0,Ø0,18,3C,7E
,18,18,18,18,Ø0,Ø0,Ø0
70 DATA 3C,06,3E,66,3B,Ø0,60,60,
7C,66,66,66,7C,Ø0,Ø0,Ø0,3C,66,60
,66,3C,Ø0,06,06,3E,66,66,66,3E,0
0,Ø0,Ø0,3C,66,7E,60,3E,Ø0,0E,1A,
18,3C,18,18,18,Ø0,Ø0,Ø0,3E,6E,6E
,36,06,3C,60,60,7C,66
75 DATA 66,66,66,Ø0,18,Ø0,38,18,
18,18,3C,Ø0,06,Ø0,06,06,06,66,66
,3C,60,60,6C,78,70,78,6C,Ø0,38,1
8,18,18,18,18,3C,Ø0,Ø0,Ø0,36,7F,
6B,63,63,Ø0,Ø0,Ø0,DC,66,66,66,66
,Ø0,Ø0,Ø0,3C,66,66,66
80 DATA 3C,Ø0,Ø0,Ø0,7C,66,66,7C,
60,60,Ø0,Ø0,3E,66,66,3E,06,06,Ø0
,Ø0,5C,66,60,60,60,Ø0,Ø0,Ø0,3E,6
0,3C,06,7C,Ø0,Ø0,30,78,30,30,36,
1C,Ø0,Ø0,Ø0,66,66,66,66,3B,Ø0,Ø0
,Ø0,66,66,66,3C,18,Ø0
85 DATA Ø0,Ø0,63,63,6B,7F,36,Ø0,
Ø0,Ø0,66,3C,18,3C,66,Ø0,Ø0,Ø0,Ø0,66
,66,66,3E,06,3C,Ø0,Ø0,7E,0C,18,3
0,7E,Ø0,08,0C,7E,7F,7E,0C,08,Ø0,
08,18,3F,7F,3F,18,08,Ø0,08,1C,3E
,7F,1C,1C,1C,Ø0,1C,1C
90 DATA 1C,7F,3E,1C,08,Ø0,FF,FF,
FF,FF,FF,FF,FF,FF,Ø0,E6,10,27,F3
,4C,10,21,0C,59,8E,Ø0,Ø0,C6,01
```



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Feature Program

Crunch Numbers for Fun, Not Profit

Number Cruncher is a simple yet addictive game. Points are scored by steering a "cruncher" over scrolling numbers, which are worth their face value. For example, if the cruncher passes over a 5, five points are scored. Obviously the goal is to get as many points as possible during a fixed amount of time. If you beat the previous high score, you are treated to a special high-score screen.

Number Cruncher works on any CoCo with at least 16K and Extended BASIC. After entering the listing, run the program and the title screen appears. To start the game, press the space bar — watch out, though, because the numbers start scrolling down the screen pretty quickly. Use the left and right arrows to control the cruncher, which appears at the bottom of the screen. (Hold the either key down for continuous movement in that direction.)

You can tell when points are scored by the sound and the number being written on the right side of the screen. A score of 100 is good, and 120 is excellent. Luck plays a big part in scoring well, although some strategy is useful (should you go for the high numbers, or just chase as many numbers as possible?).

The program is fairly self-explanatory, but I want to point out a few items. Line 70 creates the moving border on the title screen by printing different segments of TI$. Lines 140 and 150 print the cruncher and scrolling numbers, respectively.

The arrow keys are checked in two ways: lines 180-190 determine if either key is being held down, and lines 210-220 check for brief presses of the keys. Lines 270-320 provide the high-score display; a flashing line is displayed, then is replaced with a string previously read from DATA lines (460 through 590).

Number Cruncher is great for those who like to modify programs. Try including the high-speed poke and you'll nearly change the whole game because of the speed difference. The game time can be increased by changing the value of 100 in Line 100 to a higher value. A cosmetic change to the title screen can be achieved by replacing Line 430 with

```
TI$="123456":TI$=TI$+TI$+TI$+TI$+TI$
```

More complex changes include allowing optional joystick control for the cruncher. Making the number zero worth ten points would raise scores somewhat. Or how about having a mystery score (perhaps represented by a question mark) that is worth a random number of points? CoCo 3 users could play the game on a screen of greater width, although this would require many changes in the program.

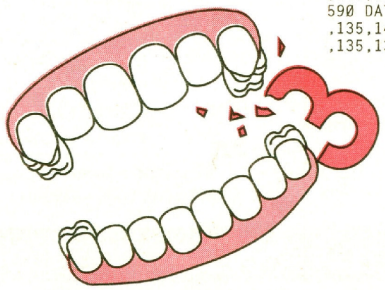
There is much to build on with *Number Cruncher*. As long as the goal remains to make it to the high score display, I say "Go for it!"

Joseph Pendell has a degree in electrical engineering from the University of Maryland. In addition to programming the Color Computer, Joseph enjoys using the Macintosh. His hobbies include riding skateboards and playing Super Nintendo.

CoCo 3

The Listing: NCRUNCH

```
1 'NUMBER CRUNCHER
2 'BY JOSEPH PENDELL
3 'COPYRIGHT (C) 1992
4 'BY FALSOFT, INC.
5 'RAINBOW MAGAZINE
30 CLEAR 1000:GOSUB 370
40 CLS:PRINT @ 72,"number"+T$+"c
runcher":IF FIRST=2 THEN PRINT @
 235,"SCORE";SC:PRINT @ 299,"HIG
H ";HS
50 IF FIRST=1 THEN PRINT @ 486,"
PRESS SPACE TO START";:FIRST=2 E
LSE PRINT @ 484,"PRESS SPACE TO
PLAY AGAIN";
60 'MOVE BORDER AROUND TITLE
70 FOR I=1 TO 5:PRINT @ 39,MID$(
TI$,I,17);:PRINT @ 71,MID$(TI$,I
+4,1);:PRINT @ 103,MID$(TI$,6-I,
17):PRINT @ 87,MID$(TI$,11-I,1);
:FOR J=1 TO 2:IF INKEY$<>" " THE
N NEXT J,I:GOTO 70
80 CLS:GOSUB 350
90 'START THE GAME
100 FOR RACE=1 TO 100
110 'CHECK FOR SCORE
120 S=PEEK(1057+X):IF S<97 THEN
PRINT @ 511," ";:PRINT @ 506,T$;
:ELSE S=S-112:SC=SC+S:PRINT @ 50
7,L$(S);:PRINT @ 506,T$;:SOUND S
*20+1,1
130 'UPDATE SCREEN
140 PRINT @ X,X$;
150 PRINT @ RND(24)+480,CHR$(RND
(10)+47);
160 'CHECK IF ARROW KEYS PRESSED
170 A$=INKEY$:IF A$<>"" THEN 210
180 IF PEEK(343)=247 THEN IF X>0
 THEN X=X-1
190 IF PEEK(344)=247 THEN IF X<2
3 THEN X=X+1
200 GOTO 230
210 IF A$=CHR$(8) THEN IF X>0 TH
EN X=X-1
220 IF A$=CHR$(9) THEN IF X<23 T
HEN X=X+1
230 NEXT RACE
240 'IF HIGH SCORE THEN SHOW A S
PECIAL DISPLAY
250 FOR I=1 TO 250:NEXT I:IF HS=
>SC THEN 40
260 HS=SC:PRINT @ 511," ";
270 FOR I=448 TO 0 STEP -32:FOR
J=255 TO 143 STEP -16:PRINT @ I,
STRING$(32,J);:NEXT J,I
280 FOR I=32 TO 128 STEP 32:FOR
J=255 TO 143 STEP -16:PRINT @ I,
STRING$(32,J);:NEXT J:PRINT @ I,
TAB(10) NP$(I/32);:NEXT I
290 FOR J=255 TO 143 STEP -16:PR
INT @ 160,STRING$(32,J);:NEXT J
300 FOR I=192 TO 288 STEP 32:FOR
 J=255 TO 143 STEP -16:PRINT @ I
,STRING$(32,J);:NEXT J:PRINT @ I
,TAB(9) HP$((I-160)/32);:NEXT I
310 FOR J=255 TO 143 STEP -16:PR
INT @ 320,STRING$(32,J);:NEXT J
320 FOR I=352 TO 448 STEP 32:FOR
 J=255 TO 143 STEP -16:PRINT @ I
,STRING$(32,J);:NEXT J:PRINT @ I
,TAB(6) SP$((I-320)/32);:NEXT I
330 FOR I=1 TO 1000:NEXT I:GOTO
40
340 'INITIALIZE FOR EACH GAME
350 X=12:SC=0:RETURN
360 'INITIALIZE ONCE
370 FIRST=1:HS=0:X$=CHR$(138)+CH
R$(143)+CHR$(133):T$=CHR$(128)
380 L$(0)="ZERO ":L$(1)="ONE  ":
L$(2)="TWO  ":L$(3)="THREE":L$(4
)="FOUR ":L$(5)="FIVE "
390 L$(6)="SIX  ":L$(7)="SEVEN":
L$(8)="EIGHT":L$(9)="NINE "
400 FOR U=1 TO 4:FOR Z=1 TO 13:R
EAD ZZ:NP$(U)=NP$(U)+CHR$(ZZ):NE
XT Z,U
410 FOR U=1 TO 4:FOR Z=1 TO 13:R
EAD ZZ:HP$(U)=HP$(U)+CHR$(ZZ):NE
XT Z,U
420 FOR U=1 TO 4:FOR Z=1 TO 18:R
EAD ZZ:SP$(U)=SP$(U)+CHR$(ZZ):NE
XT Z,U
430 FOR I=159 TO 239 STEP 16:TI$
=TI$+CHR$(I):NEXT I:TI$=TI$+TI$+
TI$+TI$
440 RETURN
450 'DATA FOR "NEW"
460 DATA 132,143,143,133,138,131
,131,143,133,143,143,133,143
470 DATA 133,134,143,133,138,140
,141,143,133,142,143,133,143
480 DATA 133,143,134,133,138,143
,143,143,132,135,134,133,143
490 DATA 135,143,143,135,139,131
,131,143,135,143,143,135,143
500 'DATA FOR "HIGH"
510 DATA 133,143,133,139,129,143
,137,131,134,143,133,143,133
520 DATA 132,140,133,143,133,143
,133,143,143,143,132,140,133
530 DATA 133,143,133,143,133,143
,134,143,130,143,133,143,133
540 DATA 135,143,135,139,131,143
,143,131,131,143,135,143,135
550 'DATA FOR "SCORE"
560 DATA 137,131,134,143,137,131
,134,143,142,131,141,143,129,131
,141,138,131,131
570 DATA 134,140,141,143,133,143
,143,143,133,143,138,143,132,140
,135,138,140,141
580 DATA 141,143,138,143,133,143
,142,143,134,143,137,143,133,134
,143,138,143,143
590 DATA 139,131,135,143,139,131
,135,143,143,131,143,143,135,143
,135,139,131,131
```



10

Received and Certified

The following products have recently been received by THE RAINBOW, examined by our staff and issued the Rainbow Seal of Certification, your assurance that we have seen the product and have ascertained that it is what it purports to be.

Sink the Armada, a GUI-driven game that plays much like *Battleship* except that your opponent is the CoCo. Supports both Hi- and Lo-Res mouse/joystick interfaces. Requires a CoCo 3 with at least 256K, an RGB monitor, a mouse or joystick, OS-9 Level II, and the `windint` module and `control` program from *Multi-Vue. MV Systems, P.O. Box 818, Arvada, CO 80001-0818, (303) 420-7777; $17.95.*

KWIKGEN v1.01, an OS-9 utility for creating and modifying the OS-9 boot file. Designed to be fast and easy to use, *KWIKGEN* can load an entire existing boot file into memory for modification. When finished, the user simply writes the new boot file back to floppy disk. Requires OS-9. *Gale Force Enterprises, P.O. Box 66036, Station F, Vancouver, BC V5N 5L4, Canada; $19.95 U.S. plus $4 S/H.*

Instructional and Bible Programs, a collection of seven bible and five educational programs/games written in BASIC. Included are *Bible Scriptures*, *Bible Questions* (I, II and III), *A Bible Adventure*, *A Journey to the Promised Land*, *Vocabulary*, *Math*, *Homonyms*, *Spelling* and *Guess the Number*. Requires 64K and Extended BASIC. *Sebastian LaSpada, 531 Main Street, Dunkirk, NY 14048, (716) 366-5261; $10.*

4-D Checkers, a two-player CoCo 3 game that plays like checkers but uses a 3-by-3-by-3 grid (time is the fourth dimension). Offers beginner, intermediate and expert levels, and supports the Speech/Sound Cartridge and RGB or composite monitors. *N*Johnson Software, 5830A Reinke Drive, Crestview, FL 32536, (904) 682-2907; introductory price is $14.95.*

The CoCo Collection, a compendium of 15 games and utilities in BASIC. Included are *Blind Poker*, *Mind Boggler*, *Calendar Maker*, *Connect Four*, *DOS Commands*, *Hangman Junior*, *Indian Poker*, *Pair Two*, *A Day at the Races*, *Reach for the Money*, *Slot Machine* (*One* and *Two*), *Tic-Tac-Toe*, *Lock* and *Setup*. Requires a CoCo 3 and a disk drive. *Sheldon Parsons, P.O. Box 117, Notre Dame Bay, NF A0J 1A0, Canada; $9.95 Cdn. plus $2 S/H.*

CoCo Cassette #116, a variety of programs presented monthly for the CoCo 1, 2 and 3. This issue contains, *Chopper*, an arcade rescue game; *Richer or Poorer*, a graphic board game; *Menu Maker*, for creating menus for your programs; *The Castle*, an arcade-style game; *Help!*, a dodge-the-car game; *Baseball Card Database*; *Snow Mobile*, a winter-sports jumping game; *Astroid Smash*; *Daffi-nition*, a word game for two players; and *DreamQuest 3*, a disk-only CoCo 3 adventure. *T & D Software, 2490 Miles Standish Drive, Holland, MI 49424, (616) 399-9468; $8.*

The Rainbow Seal of Certification is open to all manufacturers of products applicable to the Tandy Color Computer, regardless of whether or not those companies advertise in THE RAINBOW. By awarding the Seal, we certify the product exists — we have a sample copy and have examined it. However, this does not constitute any guarantee of satisfaction. As soon as possible, these products will be forwarded to reviewers for evaluation.

The 11th Year of THE RAINBOW

Compiled by Julie Hutchinson

Eleven years? That's right, and this is our ninth yearly index of articles and reviews. The items listed here appear in issues of THE RAINBOW from July 1991 to June 1992. (Previous indices appear in past July issues, starting with July 1984.) To complete your RAINBOW library, you'll find more information about how to get back issues with your favorite programs and articles on Page 18 of this issue.

BUSINESS

Krueger, Roger F. "CoCo Writes Purchase Orders"; CoCo3; June 1992, p.1. Use the CoCo 3 for mail-order and other needs. COCOPO.

COMMUNICATIONS

Ford, Steven. "CoCo Conversation"; July 1991, p.22. Getting your ham radio license.
Hrach, Warren C. "RiBBS List"; November 1991, p.14. A stick-to-your-RiBBS idea for CoCo communications.
Kessler, Gary. "Serial Asynchronous Communications"; June 1992, p.27. A look at the nitty gritty behind modems.
Kuns, Eddie. "Delphi Bureau"; July 1991, p.45. A mixed bag of tricks.
Kuns, Eddie. "Delphi Bureau"; August 1991, p.46. Literally speaking.
Kuns, Eddie. "Delphi Bureau"; September 1991, p.28. More dot commands.
Kuns, Eddie. "Delphi Bureau"; October 1991, p.14. Database reconstruction.
Kuns, Eddie. "Delphi Bureau"; November 1991, p.31. Group descriptions.
Kuns, Eddie. "Delphi Bureau"; December 1991, p.32. Submission ideas.
Kuns, Eddie. "Delphi Bureau"; January 1992, p.16. Editing submissions.
Kuns, Eddie. "Delphi Bureau"; February 1992, p.29. Editing submissions II.
Kuns, Eddie. "Delphi Bureau"; May 1992, p.25.
Kuns, Eddie. "Delphi Bureau"; June 1992, p.18. New Features.
Rainbow Staff, The. "Data Transmission Reaches New Speeds"; March 1992, p.1.

EDITORIAL COMMENT

Falk, Lonnie. "Print#-2"; July 1991, p.08.
Falk, Lonnie. "Print#-2"; August 1991, p.10.
Falk, Lonnie. "Print#-2"; September 1991, p.08.
Falk, Lonnie. "Print#-2"; October 1991, p.08.
Falk, Lonnie. "Print#-2"; November 1991, p.08.
Falk, Lonnie. "Print#-2"; December 1991, p.08.
Falk, Lonnie. "Print#-2"; January 1992, p.07.
Falk, Lonnie. "Print#-2"; February 1992, p.07.
Falk, Lonnie. "Print#-2"; March 1992, p.02.
Falk, Lonnie. "Print#-2"; April 1992, p.02.
Falk, Lonnie. "Print#-2"; May 1992, p.02.
Falk, Lonnie. "Print#-2"; June 1992, p.2.

EDUCATION

Cheves, Warren. "Let CoCo Do the Grading"; CoCo1/CoCo2/CoCo3; September 1991, p.14. A multiple-choice test grader with strings attached. MCTEST.
Elliott, Jr. Phil. "Name That Country"; CoCo3; September 1991, p.058. A graphics-based quiz on nations. COUNTRY.

GAMES

Aftamonow, George & Aftamonow, Ellen. "Swap Around for Logic Buffs"; CoCo3; May 1992, p.17. Test your logical thinking skills. SWAP.
Dueck, Jon. "Pirate's Treasure"; CoCo1/CoCo2/CoCo3; December 1991, p.46. A text adventure for use with the CoCo 1, 2 and 3. DEMON.
Gattis, Kevin. "The Wizard Puts a Hex on Checkers"; CoCo1/CoCo2/CoCo3; March 1992, p.1. A twist on checkers as we know it. WIZARD.
Golias, Ruth. "Activities for a Rainy Day"; CoCo3; April 1992, p.4. Eensey Weensey Spider in graphic and musical form. EW-SPIDER.
Hegberg, Joel M. "Racing Season Opens!"; CoCo3; May 1992, p.28. Auto race through all four seasons. SRACER.
Kimball, Bob. "Patriot Command"; CoCo1/CoCo2/CoCo3; April 1992, p.20. Desert warfare for the CoCo. PATRIOT.
McDowell, Jim. "Two Players for the Price of One"; CoCo1/CoCo2/CoCo3; June 1992, p.11. A two-player arcade game for all CoCos. STARGRAB.
Quellhorst, George. "Pyramid 2"; CoCo1/CoCo2/CoCo3; October 1991, p.25. An odds-on favorite with Solitaire. PYRA-MID2.
Renfro, Brad. "Word Search"; CoCo3; March 1992, p.6. A word finder for word-search players. WORDFIND.
Saya, John A. "Quick Reflexes Are a Must"; CoCo3; April 1992, p.25. A game of luck (and skill). TESTLUCK.
Saya, John A. "Get a Bang Out of Word Games"; CoCo3; June 1992, p.22. Beat the bomb by unscrambling the words. BEATBOMB.
Schaller, David. "Superdice"; CoCo1/CoCo2/CoCo3; July 1991, p.41. A modern roll for a seasoned game. SUPRDICE.
Speight, Kevin. "Logic Puzzler"; CoCo1/CoCo2/CoCo3; February 1992, p.024. An endless supply of logic puzzles. LOGIC.
Weisenburger, M. "Megatank"; CoCo3; August 1991, p.34. A battle of wits against alien forces. MEGATANK.

GENERAL

Moore, Rob. "Tenth Year of The RAINBOW, The"; July 1991, p.60. Index to articles, programs, reviews and authors from 1991.
Palmer, Bill. "HP DeskJet and the CoCo, The"; May 1992, p.1. Using the DeskJet with the CoCo for better results.
Rainbow Staff, The. "The Computer Will"; April 1992, p.1. A look at making a will for your computer system.

GRAPHICS

Bernico, Bill. "Add Pizazz to Title Screens"; CoCo1/CoCo2/CoCo3; May 1992, p.30. Use graphics tricks to create fancy title screens. TITLES.
Curtis, H. Allen. "Ultralace: The Epson Version"; CoCo3; August 1991, p.56. Part IV brings the Epson/IBM-compatible version. ULE.
Curtis, H. Allen. "Ultralace: The Tandy Version"; CoCo3; July 1991, p.34. Part III brings the Tandy version of main Ultralace program. ULT.
Curtis, H. Allen. "Ultralace: Tying the Knot"; CoCo3; September 1991, p.32. Instructions for using both versions of the CoCo 3 desktop.
Curtis, H. Allen. "Ultralace: Update and Upgrade"; CoCo3; May 1992, p.20. ALTUL.
Dahlke, Ron. "Expander Gives the Full CoCo 3 Picture"; CoCo3; June 1992, p.24. Using the full 225 lines on the Hi-Res screen. EXPANDER.
Friesen, Geoff. "Font Magician"; CoCo3; August 1991, p.06. Add the IBM extended character set to the CoCo 3's graphics. MKFONT.
Kenny, Keiran. "CoCo 3 Sees Stars"; CoCo3; April 1992, p.8. CoCo 3 draws stars with various numbers of points. VARIS-TAR.
Mitchel, Barry. "Turn the World On End"; CoCo3; June 1992, p.12. A graphics and sound demo for the CoCo 3. INORBIT.
Severs, Roger. "Gone Fishin'"; CoCo3; April 1992, p.27. A quickie animation demo for the CoCo 3. FISHIN.

HARDWARE

Charrois, Dan. "Interrupt-Driven Serial Communications"; CoCo3; February 1992, p.36. Reliable host operation through the CoCo 3 serial port. DANTERM.
Distefano, Tony. "Turn of the Screw"; July 1991, p.48. A slice of time.
Distefano, Tony. "Turn of the Screw"; September 1991, p.42. It's about time. SETM.
Distefano, Tony. "Turn of the Screw"; October 1991, p.18. EPROM programmer, too. EPROM.ASM.
Distefano, Tony. "Turn of the Screw"; January 1992, p.36. Hard drives and SCSI.
Goodman, Marty. "Modification Allows Y Cables"; March 1992, p.7. A fix for disk controllers for use on Y cables.
Goodman, Marty. "RS-232 Retrofit"; July 1991, p.10. Convert a DC Modem Pak into an RS-232 pack.
Goodman, Marty. "Upgrade Your Multi-Pak"; October 1991, p.052. Using the MPI with the CoCo 3.
Steidl, Jeff. "Pause Switch Adds Freedom to CoCo Habits"; June 1992, p.10. A pause swicth that works with all programs and CoCos.

HOME APPLICATIONS

Duff, Stephen. "Badge Master"; CoCo1/CoCo2/CoCo3; November 1991, p.46. Track awards for members of your organization. BADGE.
Griffard, Bob. "House Inventory"; CoCo1/CoCo2/CoCo3; July 1991, p.14. Making a list and checking it twice. HOUSEINV.
Kiedaisch, Charles. "Bar Graph Printer"; CoCo1/CoCo2/CoCo3; June 1992, p.24. A way to print quick and easy bar graphs. BARGRAPH.
Masterson, Peter. "Master List"; CoCo1/CoCo2/CoCo3; March 1992, p.24. A feature-packed filer. MLDATA.
Polonsky, David. "Versabase"; CoCo3; February 1992, p.10. A feature-packed flexible filing system. VCRDATA.
Sabel, A.J. "Spreadsheet Gets Right on the Course"; CoCo1/CoCo2/CoCo3; April 1992, p.1. A spreadsheet template for golf handicapping.
Speight, Kevin. "Matchmaker, Matchmaker"; CoCo1/CoCo2/CoCo3; June 1992, p.16. Pairing "couples" for most any purpose. MATCHMAK.
Spencer, Brad. "CoCo 3 Stores Recipes, The"; CoCo3; March 1992, p.14. A repeat recipe filer for the CoCo 3. RECIPE2.

MUSIC

Miller, William K. "Music Tutor"; CoCo3; October 1991, p.59. Learn to read music with a quiz. NOTETUTR.
Noon, Walt. "CoCo Sound Generator, The"; CoCo1/CoCo2/CoCo3; December 1991, p.30. Add bells and whistles to your BASIC creations. SOUNDGEN.

NOVICES NICHE

Aftamonow, George. "Peggity"; CoCo3; December 1991, p.22. PEGGITY.
Barberian Jr., Rich. "Echo"; CoCo1/CoCo2/CoCo3; November 1991, p.27. ECHO.
Bernico, Bill. "By the Numbers"; CoCo3; January 1992, p.42. NUMBERS.
Bernico, Bill. "Pop-Up Menus"; CoCo3; February 1992, p.34. POPUPMEN.
Bernico, Bill. "Press Continue"; CoCo1/CoCo2/CoCo3; December 1991, p.20. PRESCONT.
Clemons, John D. "CoCo-Dot"; CoCo3; November 1991, p.28. COCODOT.
Day, Darren Blaine. "File Size"; CoCo1/CoCo2/CoCo3; December 1991, p.20. FILESIZE.
Eary, Danny & Eary, Peggy. "Christmas Home"; CoCo1/CoCo2/CoCo3; January 1992, p.39. XMASHOME.
Friesen, Geoff. "Improved Directory"; CoCo3; December 1991,

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p.21. IDIR.
Gibson, Charles. "Tax Tables"; CoCo1/CoCo2/CoCo3; August 1991, p.24. TAXTABLE.
Golias, Ruth. "Indians"; CoCo3; October 1991, p.39. INDIANS.
Hegberg, Joel. "Text Screen Dump"; CoCo1/CoCo2/CoCo3; August 1991, p.23. TEXTDUMP.
Katsekes, Chuck. "Palette Control"; CoCo3; August 1991, p.23. PAL40-80.
Kenny, Keiran. "Color Doodler, A"; CoCo3; October 1991, p.36. CLRDUDLR.
Kenny, Keiran. "File Finder"; CoCo1/CoCo2/CoCo3; November 1991, p.27. FILEFNDR.
Kenny, Keiran. "PMODE 4 Snapshot"; CoCo1/CoCo2/CoCo3; December 1991, p.21. PM4PTSCR.
Kenny, Keiran. "Palette Tints"; CoCo3; December 1991, p.25. TINTPAL.
Kenny, Keiran. "Poke Text"; CoCo1/CoCo2/CoCo3; January 1992, p.39. POKETEXT.
Kenny, Keiran. "Pre-fab Arkitekt"; CoCo1/CoCo2/CoCo3; February 1992, p.33. ARKITEKT.
Kenny, Keiran. "Tape-to-Tape ML"; CoCo1/CoCo2/CoCo3; November 1991, p.28. COPYML.
Kenny, Keiran. "Text & Graphics"; CoCo1/CoCo2/CoCo3; August 1991, p.22. PIXTEXT4.
Kenny, Keiran. "Vocabulary Aid"; CoCo1/CoCo2/CoCo3; October 1991, p.38. VOCABLRY.
Knoppow, Jim. "Screen Selector"; CoCo3; January 1992, p.40. SCREEN.
Musumeci, John. "DeSpace, DeSpace"; CoCo1/CoCo2/CoCo3; January 1992, p.40. DESPACE.
Norris, John. "Cable TV"; CoCo1/CoCo2/CoCo3; October 1991, p.36. CABLETV.
Nugent, Robert C. "Egg Timer"; CoCo3; November 1991, p.29. EGGTIMER.
Page, Mark. "Check Disk"; CoCo3; January 1992, p.41. CHKDSK.
Polonsky, David. "Photo Database"; CoCo1/CoCo2/CoCo3; January 1992, p.42. CAMERA.
Ricketts, Steve. "Disk Table"; CoCo1/CoCo2/CoCo3; January 1992, p.40. DISKTABL.
Saya, John A. "CoCo Hangman"; CoCo3; February 1992, p.32. COCOHANG.
Voss, Mikel. "Sine Lines 3"; CoCo3; February 1992, p.32. SINLINE3.

OS-9

Besherse, Bernie E. "Addressed to You"; CoCo1/CoCo2/CoCo3; September 1991, p.46. An easy-to-use address label maker for BASIC09. ADRLABEL.B09.
Dubuc, Francois. "Spicy Dice"; CoCo3; December 1991, p.14. A BASIC09 dice game. DICE_GAME.
Gault, Robert. "Interrupted Again"; CoCo3; August 1991, p.28. A software technique to eliminate interrupt problems. IRQPOLL.ASM.
Goldberg, Stephen B. "Easy Display"; CoCo1/CoCo2/CoCo3; October 1991, p.048. A display command that accepts decimal numbers. DISPLAY.ASM.
Goldberg, Stephen B. "Lost and Found: An OS-9 File Finder"; CoCo1/CoCo2/CoCo3; March 1992, p.27. File find for the OS-9 operating system. FIND.ASM.
Goldberg, Stephen B. "Pretty-print OS-9 Source Code"; CoCo1/CoCo2/CoCo3; June 1992, p.8. Columnarize OS-9 assembly listings the easy way. PRETTY.ASM.
Goldberg, Stephen B. "Vname Lets You Make the Call"; CoCo1/CoCo2/CoCo3; May 1992, p.6. Change disk volume names on the fly. VNAME.ASM.
Kientzle, Tim. "Communicating With OS-9"; CoCo1/CoCo2/CoCo3; November 1991, p.22. Getting the word out about going online.
Kientzle, Tim. "Making the Move"; CoCo1/CoCo2/CoCo3; October 1991, p.010. Transferring files between Disk BASIC and OS-9.
Law, Greg. "BreakPoint"; CoCo3; August 1991, p.16. Using system calls. GET_ID.C.
Law, Greg. "BreakPoint"; October 1991, p.41. Creating a C library.
Law, Greg. "BreakPoint"; CoCo1/CoCo2/CoCo3; December 1991, p.44. The procedure generator. PROCGEN.B09.
Law, Greg. "BreakPoint"; CoCo3; February 1992, p.18. Upper-case directories. MAKEDIR.C.
Law, Greg. "BreakPoint"; CoCo3; April 1992, p.18. Salvage Files. SALVAGE.ASM.
Law, Greg. "BreakPoint"; CoCo3; May 1992, p.22. TRS.C.

PROGRAMMING

Dessel, Jason. "New CLS Routines: ML and the CoCo 3"; CoCo3; June 1992, p.1. Altering CLS to clear the CoCo 3 screens in new ways. SNAKE.
Mabry, George M. "Card-Player's Sort, The"; CoCo1/CoCo2/CoCo3; June 1992, p.5. Sort data the card-players way. CARDSORT.
Nee, William P. "Assembly Line, The"; CoCo1/CoCo2/CoCo3; July 1991, p.28. The machine-language mailbag. PUCHINK1.
Nee, William P. "Assembly Line, The"; CoCo1/CoCo2/CoCo3; August 1991, p.41. Using assembly-language macros. ENLARGE1.
Nee, William P. "Assembly Line, The"; CoCo1/CoCo2/CoCo3; September 1991, p.18. A fine fern. AFFCOMP.
Nee, William P. "Assembly Line, The"; CoCo1/CoCo2/CoCo3; October 1991, p.43. CoCo makes waves. WAVES1.
Nee, William P. "Assembly Line, The"; CoCo1/CoCo2/CoCo3; November 1991, p.18. The Game of Life. LIFEDRVR.
Nee, William P. "Assembly Line, The"; CoCo1/CoCo2/CoCo3; January 1992, p.20. The game of Mill. MILLDRV.
Nee, William P. "Assembly Line, The"; CoCo1/CoCo2/CoCo3; February 1992, p.20. Zig Zag. ZIGZAGDR.

QUESTION & ANSWER

Goodman, Marty. "CoCo Consultations"; July 1991, p.18.
Goodman, Marty. "CoCo Consultations"; August 1991, p.30.
Goodman, Marty. "CoCo Consultations"; September 1991, p.36.
Goodman, Marty. "CoCo Consultations"; October 1991, p.32.
Goodman, Marty. "CoCo Consultations"; November 1991, p.31.
Goodman, Marty. "CoCo Consultations"; December 1991, p.26.
Goodman, Marty. "CoCo Consultations"; January 1992, p.30.
Goodman, Marty. "CoCo Consultations"; February 1992, p.26.
Goodman, Marty. "CoCo Consultations"; March 1992, p.20.
Goodman, Marty. "CoCo Consultations"; April 1992, p.12.
Goodman, Marty. "CoCo Consultations"; May 1992, p.10.
Goodman, Marty. "CoCo Consultations"; June 1992, p.4.
Rainbow Staff, The. "OS-9 Hotline"; July 1991, p.58. Passing parameters.
Rainbow Staff, The. "OS-9 Hotline"; August 1991, p.38. Down to business.
Rainbow Staff, The. "OS-9 Hotline"; September 1991, p.48.
Rainbow Staff, The. "OS-9 Hotline"; October 1991, p.30.

TUTORIAL

Coldwell, John A. "Multi-Column Directories Get Easier"; CoCo3; April 1992, p.10. Using pokes to achieve multi-column directory listings. SHORTCUT.

UTILITY

Augsburg, Cray. "Speedy PMODE Screen Dump"; CoCo1/CoCo2/CoCo3; May 1992, p.1. Machine-language PMODE dumps for most printers. TANDUMP.
Collyer, John. "EZDASM: Tear Into Memory"; CoCo1/CoCo2/CoCo3; April 1992, p.8. An easy-to-use disassembler. EZDASM.
Friesen, Geoff. "Program Launcher Helps Users Get Started"; CoCo3; April 1992, p.16. A BASIC-program launcher for the CoCo 3. LAUNCHER.
Hameluck, Jeff. "Printing Sideways"; CoCo3; April 1992, p.23. A way to make wide printouts look more professional. SIDEWAYS.
Hegberg, Joel. "DOS Boot for BASIC Programs"; CoCo1/CoCo2/CoCo3; March 1992, p.10. Tell BASIC to boot your programs with DOS. AUTOBOOT.
Johnson, Nick. "ID: Get File Information Quickly"; CoCo3; May 1992, p.28. Get all the info on your disks' contents. ID.
Kientzle, Tim. "Archiving Files"; CoCo1/CoCo2/CoCo3; January 1992, p.10. A look at what archiving tools are available.
Rumpel, Kathy. "Directory Helper"; CoCo3; January 1992, p.26. An icon-driven disk-file manager. DIRECT.
Woolridge, Mike. "Move PRINT@ to a New Location"; CoCo3; June 1992, p.14. A converter for relocating PRINT@ statements. CONVERT.
Wyss-Gallifent, S.T. "Gray-Level Printing for HSCREEN2"; CoCo3; May 1992, p.4. Achieve 11 gray levels for HSCREEN2 printouts. AUTOGRAY.

REVIEWS

"All Rick's Software"; January 1992, p.44.
"CF83 Forth"; February 1992, p.42.
"CIII PagesE 2.5"; December 1991, p.39.
"Calendar 1"; September 1991, p.54.
"CoCo Calculator"; January 1992, p.46.
"CoCo Family Recorder, The"; June 1992, p.15.
"CoCo Labels"; July 1991, p.51.
"CoCo Tools"; November 1991, p.40.
"Crystal City"; July 1991, p.53.
"Cybervolce"; December 1991, p.36.
"DIR"; May 1992, p.30.
"DMA: The Disk Manager's Apprentice"; November 1991, p.37.
"DPMax"; May 1992, p.21.
"Data Windows"; November 1991, p.39.
"Desk Accessory Pak"; June 1992, p.13.
"Digitizer 3+, The"; July 1991, p.51.
"Duo Deck Solitaire"; March 1992, p.30.
"Gems"; February 1992, p.47.
"Goodies Disk Two"; April 1992, p.04.
"HideScreen"; January 1992, p.44.
"High Finance"; September 1991, p.52.
"KBCom"; March 1992, p.12.
"MM/1"; December 1991, p.10.
"MV Banner"; April 1992, p.07.
"Match'em"; July 1991, p.55.
"Microware Basic"; September 1991, p.54.
"NIB Kelly & Company"; November 1991, p.41.
"NIB Swimsuits & Lingerie, Vol. I"; July 1991, p.54.
"OS-9 Calendar Utilities"; December 1991, p.38.
"OS-9 Level 2 Game Pack"; March 1992, p.22.
"OS-9 Variations of Solitaire"; April 1992, p.22.
"POWMIA Database"; November 1991, p.37.
"Photon"; May 1992, p.04.
"Printer Bible, The"; April 1992, p.19.
"Sidney, the Super Space Snake"; November 1991, p.37 <Items>"Sound Source Library, The"; March 1992, p.12.
"Soviet Bloc"; September 1991, p.52.
"Super Boot"; February 1992, p.42.
"System IV"; September 1991, p.10.
"T&D Issue #105"; September 1991, p.56.
"TV"; March 1992, p.15.
"Tomcat TC-9"; November 1991, p.010.
"Tools II"; February 1992, p.44.
"Unbelievable Offer #3"; June 1992, p.26.
"Util Disk"; July 1991, p.52.
"WPShel"; January 1992, p.46.
"Window Master 3.0"; May 1992, p.18.
"World Class Chess"; January 1992, p.47.
"ZClock"; December 1991, p.38.

AUTHORS

Aftamonow, George. "Peggity"; CoCo3; December 1991, p.22. PEGGITY.
Aftamonow, George & Aftamonow, Ellen. "Swap Around for Logic Buffs"; CoCo3; May 1992, p.17. Test your logical thinking skills. SWAP.
Augsburg, Cray. "Speedy PMODE Screen Dump"; CoCo1/CoCo2/CoCo3; May 1992, p.1. Machine-language PMODE dumps for most printers. TANDUMP.
Barberian Jr., Rich. "Echo"; CoCo1/CoCo2/CoCo3; November 1991, p.27. ECHO.
Bernico, Bill. "Add Pizazz to Title Screens"; CoCo1/CoCo2/CoCo3; May 1992, p.30. Use graphics tricks to create fancy title screens. TITLES.
Bernico, Bill. "By the Numbers"; CoCo3; January 1992, p.42. NUMBERS.
Bernico, Bill. "Pop-Up Menus"; CoCo3; February 1992, p.34. POPUPMEN.
Bernico, Bill. "Press Continue"; CoCo1/CoCo2/CoCo3; December 1991, p.20. PRESCONT.
Besherse, Bernie E. "Addressed to You"; CoCo1/CoCo2/CoCo3; September 1991, p.46. An easy-to-use address label maker for BASIC09. ADRLABEL.B09.
Charrois, Dan. "Interrupt-Driven Serial Communications"; CoCo3; February 1992, p.36. Reliable host operation through the CoCo 3 serial port. DANTERM.
Cheves, Warren. "Let CoCo Do the Grading"; CoCo1/CoCo2/CoCo3; September 1991, p.14. A multiple-choice test grader with strings attached. MCTEST.
Clemons, John D. "CoCo-Dot"; CoCo3; November 1991, p.28. COCODOT.
Coldwell, John A. "Multi-Column Directories Get Easier"; CoCo3; April 1992, p.10. Using pokes to achieve multi-column directory listings. SHORTCUT.
Collyer, John. "EZDASM: Tear Into Memory"; CoCo1/CoCo2/CoCo3; April 1992, p.8. An easy-to-use disassembler. EZDASM.
Curtis, H. Allen. "Ultralace: The Epson Version"; CoCo3; August 1991, p.56. Part IV brings the Epson/IBM-compatible version. ULE.
Curtis, H. Allen. "Ultralace: The Tandy Version"; CoCo3; July 1991, p.34. Part III brings the Tandy version of main Ultralace program. ULT.
Curtis, H. Allen. "Ultralace: Tying the Knot"; CoCo3; September 1991, p.32. Instructions for using both versions of the CoCo 3 desktop.
Curtis, H. Allen. "Ultralace: Update and Upgrade"; CoCo3; May 1992, p.20. ALTUL.
Dahlke, Ron. "Expander Gives the Full CoCo 3 Picture"; CoCo3; June 1992, p.24. Using the full 225 lines on the Hi-Res screen. EXPANDER.
Day, Darren Blaine. "File Size"; CoCo1/CoCo2/CoCo3; December 1991, p.20. FILESIZE.
Dessel, Jason. "New CLS Routines: ML and the CoCo 3"; CoCo3; June 1992, p.1. Altering CLS to clear the CoCo 3 screens in new ways. SNAKE.
Distefano, Tony. "Turn of the Screw"; July 1991, p.48. A slice of time.
Distefano, Tony. "Turn of the Screw"; September 1991, p.42. It's about time. SETM.
Distefano, Tony. "Turn of the Screw"; October 1991, p.18. EPROM programmer, too. EPROM.ASM.
Distefano, Tony. "Turn of the Screw"; January 1992, p.36. Hard drives and SCSI.
Dubuc, Francois. "Spicy Dice"; CoCo3; December 1991, p.14. A BASIC09 dice game. DICE_GAME.
Dueck, Jon. "Pirate's Treasure"; CoCo1/CoCo2/CoCo3; December 1991, p.46. A text adventure for use with the CoCo 1, 2 and 3. DEMON.
Duff, Stephen. "Badge Master"; CoCo1/CoCo2/CoCo3; November 1991, p.46. Track awards for members of your organization. BADGE.
Eary, Danny & Eary, Peggy. "Christmas Home"; CoCo1/CoCo2/CoCo3; January 1992, p.39. XMASHOME.Elliott, Jr. Phil. "Name That Country"; CoCo3; September 1991, p.058. A graphics-based quiz on nations. COUNTRY.
Falk, Lonnie. "Print#-2"; July 1991, p.08.
Falk, Lonnie. "Print#-2"; August 1991, p.10.
Falk, Lonnie. "Print#-2"; September 1991, p.08.
Falk, Lonnie. "Print#-2"; October 1991, p.08.
Falk, Lonnie. "Print#-2"; November 1991, p.08.
Falk, Lonnie. "Print#-2"; December 1991, p.08.
Falk, Lonnie. "Print#-2"; January 1992, p.07.
Falk, Lonnie. "Print#-2"; February 1992, p.07.
Falk, Lonnie. "Print#-2"; March 1992, p.02.
Falk, Lonnie. "Print#-2"; April 1992, p.02.
Falk, Lonnie. "Print#-2"; May 1992, p.02.
Falk, Lonnie. "Print#-2"; June 1992, p.2.
Ford, Steven. "CoCo Conversation"; July 1991, p.22. Getting your ham radio license.
Friesen, Geoff. "Font Magician"; CoCo3; August 1991, p.06. Add the IBM extended character set to the CoCo 3's graphics. MKFONT.
Friesen, Geoff. "Improved Directory"; CoCo3; December 1991, p.21. IDIR.
Friesen, Geoff. "Program Launcher Helps Users Get Started"; CoCo3; April 1992, p.16. A BASIC-program launcher for the CoCo 3. LAUNCHER.
Gattis, Kevin. "The Wizard Puts a Hex on Checkers"; CoCo1/CoCo2/CoCo3; March 1992, p.1. A twist on checkers as we know it. WIZARD.
Gault, Robert. "Interrupted Again"; CoCo3; August 1991, p.28. A software technique to eliminate interrupt problems. IRQPOLL.ASM.
Gibson, Charles. "Tax Tables"; CoCo1/CoCo2/CoCo3; August 1991, p.24. TAXTABLE.
Goldberg, Stephen B. "Easy Display"; CoCo1/CoCo2/CoCo3; October 1991, p.048. A display command that accepts decimal numbers. DISPLAY.ASM.
Goldberg, Stephen B. "Lost and Found: An OS-9 File Finder"; CoCo1/CoCo2/CoCo3; March 1992, p.27. File find for the OS-9 operating system. FIND.ASM.
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Goldberg, Stephen B. "Vname Lets You Make the Call"; CoCo1/CoCo2/CoCo3; May 1992, p.6. Change disk volume names on the fly. VNAME.ASM.
Golias, Ruth. "Activities for a Rainy Day"; CoCo3; April 1992, p.4. Eensey Weensey Spider in graphic and musical form. EWSPIDER.
Golias, Ruth. "Indians"; CoCo3; October 1991, p.39. INDIANS.
Goodman, Marty. "CoCo Consultations"; July 1991, p.18.
Goodman, Marty. "CoCo Consultations"; August 1991, p.30.
Goodman, Marty. "CoCo Consultations"; September 1991, p.36.
Goodman, Marty. "CoCo Consultations"; October 1991, p.32.
Goodman, Marty. "CoCo Consultations"; November 1991, p.31.
Goodman, Marty. "CoCo Consultations"; December 1991, p.26.
Goodman, Marty. "CoCo Consultations"; January 1992, p.30.
Goodman, Marty. "CoCo Consultations"; February 1992, p.26.
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Goodman, Marty. "CoCo Consultations"; April 1992, p.12.
Goodman, Marty. "CoCo Consultations"; May 1992, p.10.
Goodman, Marty. "CoCo Consultations"; June 1992, p.4.
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Hegberg, Joel. "DOS Boot for BASIC Programs"; CoCo1/CoCo2/CoCo3; March 1992, p.10. Tell BASIC to boot your programs with DOS. AUTOBOOT.
Hegberg, Joel. "Text-Screen Dump"; CoCo1/CoCo2/CoCo3; August 1991, p.23. TEXTDUMP.
Hegberg, Joel M. "Racing Season Opens!"; CoCo3; May 1992, p.28. Auto race through all four seasons. SRACER.
Hrach, Warren C. "RiBBS List"; November 1991, p.14. A stick-to-your-RiBBS idea for CoCo communications.
Johnson, Nick. "ID: Get File Information Quickly"; CoCo3; May 1992, p.28. Get all the info on your disks' contents. ID.
Katsekes, Chuck. "Palette Control"; CoCo3; August 1991, p.23. PAL40-80.
Kenny, Keiran. "CoCo 3 Sees Stars"; CoCo3; April 1992, p.8. CoCo 3 draws stars with various numbers of points. VARISTAR.
Kenny, Keiran. "Color Doodler, A"; CoCo3; October 1991, p.36. CLRDUDLR.
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Kenny, Keiran. "PMODE 4 Snapshot"; CoCo1/CoCo2/CoCo3; December 1991, p.21. PM4PTSCR.
Kenny, Keiran. "Palette Tints"; CoCo3; December 1991, p.25. TINTPAL.
Kenny, Keiran. "Poke Text"; CoCo1/CoCo2/CoCo3; January 1992, p.39. POKETEXT.
Kenny, Keiran. "Pre-fab Arkitekt"; CoCo1/CoCo2/CoCo3; February 1992, p.33. ARKITEKT.
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Kenny, Keiran. "Text & Graphics"; CoCo1/CoCo2/CoCo3; August 1991, p.22. PIXTEXT4.
Kenny, Keiran. "Vocabulary Aid"; CoCo1/CoCo2/CoCo3; October 1991, p.38. VOCABLRY.
Kessler, Gary. "Serial Asynchronous Communications"; June 1992, p.27. A look at the nitty gritty behind modems.
Kiedaisch, Charles. "Bar Graph Printer"; CoCo1/CoCo2/CoCo3; June 1992, p.24. A way to print quick and easy bar graphs. BARGRAPH.
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Kientzle, Tim. "Making the Move"; CoCo1/CoCo2/CoCo3; October 1991, p.010. Transferring files between Disk BASIC and OS-9.
Kimball, Bob. "Patriot Command"; CoCo1/CoCo2/CoCo3; April 1992, p.20. Desert warfare for the CoCo. PATRIOT.
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Kuns, Eddie. "Delphi Bureau"; July 1991, p.45. A mixed bag of tricks.
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Kuns, Eddie. "Delphi Bureau"; January 1992, p.16. Editing submissions.
Kuns, Eddie. "Delphi Bureau"; February 1992, p.29. Editing submissions II.
Kuns, Eddie. "Delphi Bureau"; May 1992, p.25.
Kuns, Eddie. "Delphi Bureau"; June 1992, p.18. New Features.
Law, Greg. "BreakPoint"; CoCo3; August 1991, p.16. Using system calls. GET_ID.C.
Law, Greg. "BreakPoint"; October 1991, p.41. Creating a C library.
Law, Greg. "BreakPoint"; CoCo1/CoCo2/CoCo3; December 1991, p.44. The procedure generator. PROCGEN.B09.
Law, Greg. "BreakPoint"; CoCo3; February 1992, p.18. Upper-case directories. MAKEDIR.C.
Law, Greg. "BreakPoint"; CoCo3; April 1992, p.18. Salvage Files. SALVAGE.ASM.
Law, Greg. "BreakPoint"; CoCo3; May 1992, p.22. TRS.C.
Mabry, George M. "Card-Player's Sort, The"; CoCo1/CoCo2/CoCo3; June 1992, p.5. Sort data the card-players way. CARDSORT.
Masterson, Peter. "Master List"; CoCo1/CoCo2/CoCo3; March 1992, p.24. A feature-packed filer. MLDATA.
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Miller, William K. "Music Tutor"; CoCo3; October 1991, p.59. Learn to read music with a quiz. NOTETUTR.
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Moore, Rob. "Tenth Year of The RAINBOW, The"; July 1991, p.60. Index to articles, programs, reviews and authors from 1991.
Musumeci, John. "DeSpace, DeSpace"; CoCo1/CoCo2/CoCo3; January 1992, p.40. DESPACE.
Nee, William P. "Assembly Line, The"; CoCo1/CoCo2/CoCo3; July 1991, p.28. The machine-language mailbag. PUCHINK1.
Nee, William P. "Assembly Line, The"; CoCo1/CoCo2/CoCo3; August 1991, p.41. Using assembly-language macros. ENLARGE1.
Nee, William P. "Assembly Line, The"; CoCo1/CoCo2/CoCo3; September 1991, p.18. A fine fern. AFFCOMP.
Nee, William P. "Assembly Line, The"; CoCo1/CoCo2/CoCo3; October 1991, p.43. CoCo makes waves. WAVES1.
Nee, William P. "Assembly Line, The"; CoCo1/CoCo2/CoCo3; November 1991, p.18. The Game of Life. LIFEDRVR.
Nee, William P. "Assembly Line, The"; CoCo1/CoCo2/CoCo3; January 1992, p.20. The game of Mill. MILLDRV.
Nee, William P. "Assembly Line, The"; CoCo1/CoCo2/CoCo3; February 1992, p.20. Zig Zag. ZIGZAGDR.
Noon, Walt. "CoCo Sound Generator, The"; CoCo1/CoCo2/CoCo3; December 1991, p.30. Add bells and whistles to your BASIC creations. SOUNDGEN.
Norris, John. "Cable TV"; CoCo1/CoCo2/CoCo3; October 1991, p.36. CABLETV.
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Quellhorst, George. "Pyramid 2"; CoCo1/CoCo2/CoCo3; October 1991, p.25. An odds-on favorite with Solitaire. PYRAMID2.
Rainbow Staff, The. "Data Transmission Reaches New Speeds"; March 1992, p.1.
Rainbow Staff, The. "OS-9 Hotline"; July 1991, p.58. Passing parameters.
Rainbow Staff, The. "OS-9 Hotline"; August 1991, p.38. Down to business.
Rainbow Staff, The. "OS-9 Hotline"; September 1991, p.48.
Rainbow Staff, The. "OS-9 Hotline"; October 1991, p.30.
Rainbow Staff, The. "The Computer Will"; April 1992, p.1. A look at making a will for your computer system.
Renfro, Brad. "Word Search"; CoCo3; March 1992, p.6. A word finder for word-search players. WORDFIND.
Ricketts, Steve. "Disk Table"; CoCo1/CoCo2/CoCo3; January 1992, p.40. DISKTABL.
Rumpel, Kathy. "Directory Helper"; CoCo3; January 1992, p.26. An icon-driven disk-file manager. DIRECT.
Sabel, A.J. "Spreadsheet Gets Right on the Course"; CoCo1/CoCo2/CoCo3; April 1992, p.1. A spreadsheet template for golf handicapping.
Saya, John A. "CoCo Hangman"; CoCo3; February 1992, p.32. COCOHANG.
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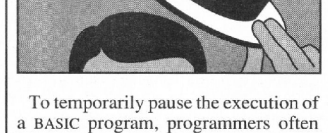
Severs, Roger. "Gone Fishin'"; CoCo3; April 1992, p.27. A quickie animation demo for the CoCo 3. FISHIN.
Speight, Kevin. "Logic Puzzler"; CoCo1/CoCo2/CoCo3; February 1992, p.024. An endless supply of logic puzzles. LOGIC.
Speight, Kevin. "Matchmaker, Matchmaker"; CoCo1/CoCo2/CoCo3; June 1992, p.16. Pairing "couples" for most any purpose. MATCHMAK.
Spencer, Brad. "CoCo 3 Stores Recipes, The"; CoCo3; March 1992, p.14. A repeat recipe filer for the CoCo 3. RECIPE2.
Steidl, Jeff. "Pause Switch Adds Freedom to CoCo Habits"; June 1992, p.10. A pause switch that works with all programs and CoCos.
Voss, Mikel. "Sine Lines 3"; CoCo3; February 1992, p.32. SINLINE3.
Weisenburger, M. "Megatank"; CoCo3; August 1991, p.34. A battle of wits against alien forces. MEGATANK.
Woolridge, Mike. "Move PRINT@ to a New Location"; CoCo3; June 1992, p.14. A converter for relocating PRINT@ statements. CONVERT.
Wyss-Gallifent, S.T. "Gray-Level Printing for HSCREEN2"; CoCo3; May 1992, p.4. Achieve 11 gray levels for HSCREEN2 printouts. AUTOGRAY.



To temporarily pause the execution of a BASIC program, programmers often use something like

```
10 A$=INKEY$:IF A$="" THEN 10
```

Another way to accomplish the same thing (perhaps you've already seen it in RAINBOW listings) is to use

```
EXEC 44539
```

This command tells the computer to wait for the user to press a key. If you need to determine which key the user presses, you can follow the EXEC command with

```
A$=CHR$(PEEK(135))
```

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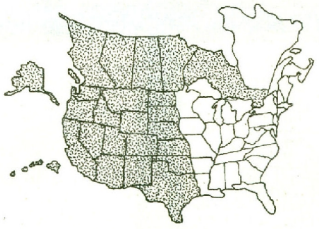
Cer-Comp	19	Owl-Ware	11
CoCoPRO!	13	Rainbow Back Issues	18
CoCoPRO!	15	Rainbow on Tape and Disk	15
CoCoPRO!	16	Rainbow Subscription	16
Computer Plus	BC	Rick's Computer Enterprise	19
Dayton Associates		Sebastian LaSpada	13
of W.R. Hall, Inc.	25	Sundog Systems	5
Delphi	21	Sundog Systems	27
Eversoft Games, Ltd	9	T & D Subscription Software	3
Farna Systems	23	T & D Subscription Software	17
Gale Force Enterprises	7	Wasatchware	27
JWT Enterprises	27		



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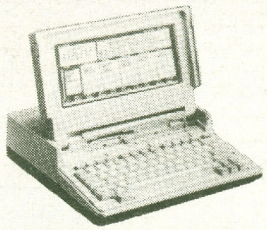

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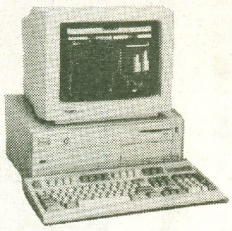

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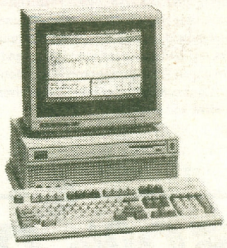

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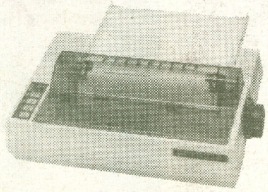

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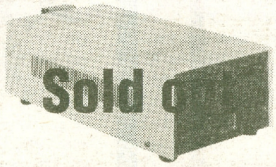

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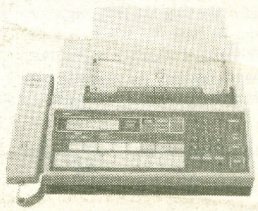

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